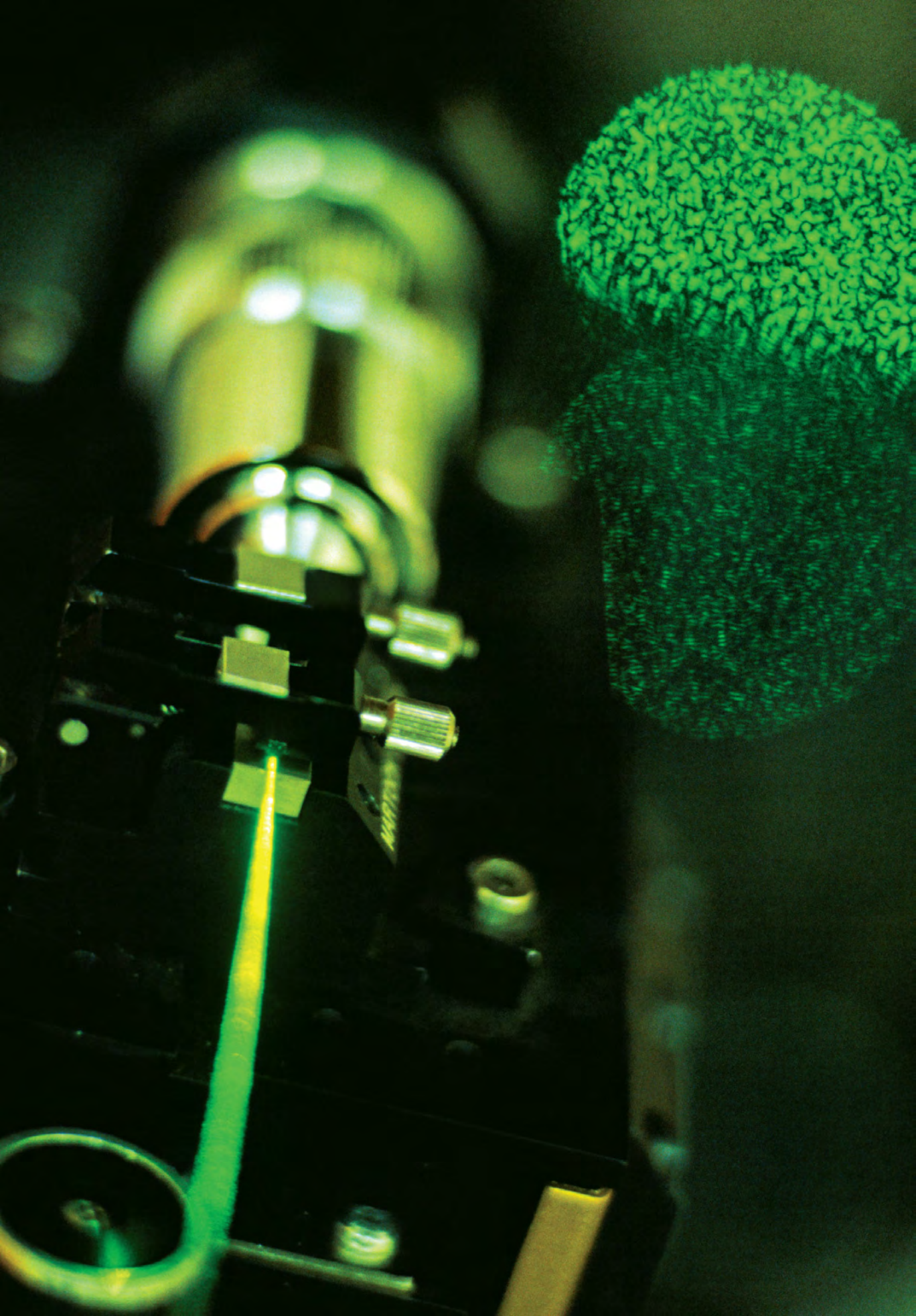
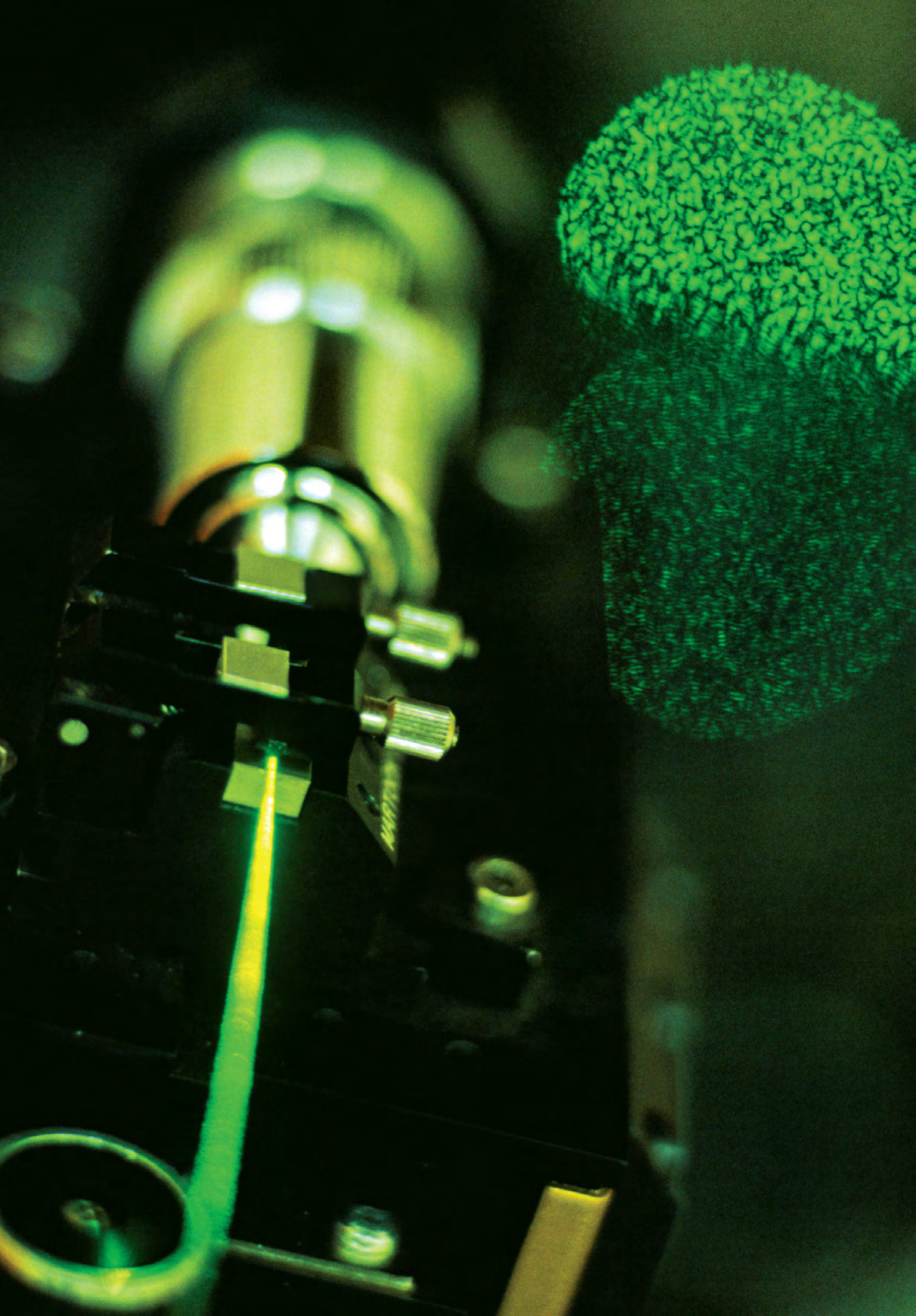


REPORT





King's College London

REPORT NUMBER 14 2006

Cover photographs by Phil Sayer

Front Cover: A store containing samples of all the elements of the periodic table, from the Materials Library at King's. The Library is an archive of more than 400 materials collected by Dr Mark Miodownik, Lecturer in Mechanical Engineering (see 'Essence of Fluorescence', page 11). It contains some of the most extraordinary substances on earth, such as a piece of Aerogel containing 99.8 per cent air; a phial of ferrofluid, a magnetic liquid which grows spikes like a hedgehog, and a tile of aluminium nitride that conducts the heat from one's hand efficiently enough to cut ice as if it were butter. These materials are gathered together not only for scientific interest, but also for their ability to fire the imagination and advance conceptualisation. Most of them would not normally be in the public arena, but are buried in mobile phones, inkjet printers or in the fuselage of jet aircraft. The Materials Library aims to give the arts community access to the fruits of publicly-funded materials science research.

Opposite: Green laser light is shone through a lens into an optical fibre, illuminating a sample. High-resolution microscopy techniques are being developed for use in cell and molecular biology research in the Physics Department at King's Strand Campus.

Every effort has been made to contact all image copyright holders. The publishers will be glad to make good in future any errors or omissions brought to their attention.

Editor Dr Christine Kenyon Jones

Design Susan Buchanan

Printer Aldridge Print Group

The King's REPORT reviews the College's work each year by featuring a sample of the research and teaching currently taking place in the College. It is the Principal's annual report to the College Council. This edition of the REPORT covers the academic year 2005-6.

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King's College London

King's College London is one of the oldest and most distinguished university institutions in the UK. It was founded by King George IV and the Duke of Wellington in 1829.

The College community now encompasses more than 5,000 staff and nearly 20,000 students, based mainly in the heart of London. The student body is approximately one-third graduate and one-fifth international.

King's is a research-led institution. The College's academic staff are involved in research activity, often at an international level, and this activity informs the highest quality of teaching and supervision for both undergraduate and graduate students. As a result, King's is generally counted in the top ten British universities and is well within the top one hundred universities worldwide. It is a member of the Russell Group of Britain's leading universities and is an independent college within the University of London.

King's is a multi-faculty institution, with nine schools of study: Biomedical & Health Sciences; Dentistry; Humanities; Law; Medicine; Nursing & Midwifery; Physical Sciences & Engineering; Psychiatry; and Social Science & Public Policy. It has five campuses, four of which are in central London and one at Denmark Hill in south London. Much of the College's medical, dental and health-related research and teaching is carried out in partnership with some of the world's most famous hospitals, including Guy's, St Thomas' and King's College hospitals and the Maudsley Hospital. The College does, however, maintain complete independence from the National Health Service both financially and in management terms. King's is one of the largest university suppliers of research to UK government departments. Its government research contracts, such as those in the fields of medicine, international relations, education and the environment, help to inform the development of public policy both in the UK and abroad.

King's has a financial turnover of more than £364 million. In 2005-6 it received around £120 million in grants from the Higher Education Funding Council and some £65 million in tuition fees and education contracts. Yet almost half its income comes from research grants and contracts, endowment income and other sources: a considerably higher proportion than is achieved by most other universities. In 2005 the College's financial strength was again awarded an 'AA-' financial rating by Standard & Poor's. Governed by a Council with a majority of members drawn from outside academic life, King's is a chartered institution with considerable discretion over how it spends both its public and private income.

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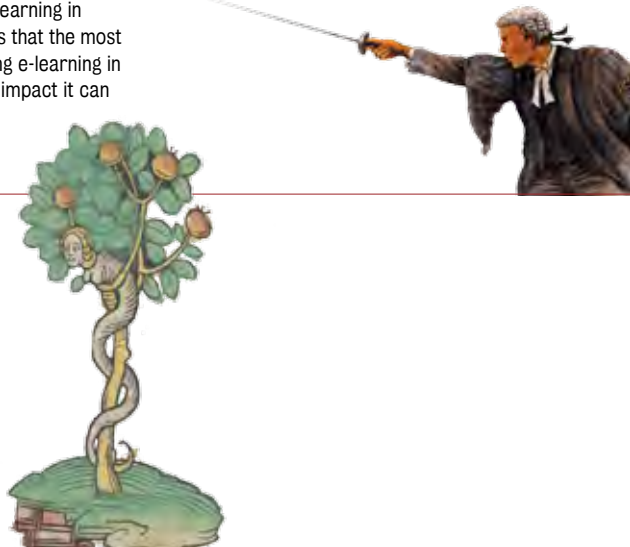
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Acknowledgements

Gifts from individuals, grant-making trusts and other organisations.





THINK GLOBAL ACT LOCAL

As the REPORT goes to press, we are close to finalising a strategic plan designed to allow King's to achieve its goal of world-class status. The past year has already seen considerable progress toward this goal.

Among this year's many achievements I particularly want to single out the siting of two new Medical Research Council research centres at King's: the Centre in Allergic Mechanisms of Asthma and the Centre for Neurodegenerative Research (see page 6). King's now has more of these MRC centres than any other university. Endorsement from another research council – that for Arts and Humanities – came in the form of four collaborative doctoral awards, which will strengthen our links with key London cultural institutions such as the British Museum (see page 10).

Also reflecting the College's spread of research excellence was the award to two individual King's academics this year of fellowships of the Royal Society and of the British Academy (see page 9). King's also emerged as one of the biggest winners in the second round of Research Councils UK fellowship awards designed to nurture postgraduate talent. Moreover, we have almost completed our Strategic Academic Initiative which has brought 60 senior academics to King's, right across the College, during the past 18 months. Dr Ignacio Ferreras, whose work on the formation of galaxies is profiled on pages 60-65, is an example of this influx of new strength and talent. We shall continue to use our annual strategic fund for specific objectives such as this, and the focus for investment in the academic year 2006-7 will be on additional staff for income generation activities: especially fundraising, technology transfer and recruitment of overseas students.

Teaching

On the teaching side, we are delighted at the success of Dr Mark Miodownik of Mechanical Engineering in winning a prestigious National Teaching Fellowship. The Graduate School,

established in September 2005, is already starting to provide a supportive network across the College by sharing good practice, strengthening the focus on graduate needs and delivering a series of services to the graduate community, and it will be further strengthened by the arrival of its new Director, Professor Vaughan Robinson of the University of Wales Swansea, in September. The outline Strategic Plan emphasises the expansion of graduate numbers generally at King's and especially of overseas graduates, and in this context I was pleased to come away from the Association of Commonwealth Universities' conference in Adelaide with the conviction that the really dynamic universities in this group are not discouraged by the decision of the Chinese and Indian governments to educate more of their graduates themselves. Indeed they intend to pursue – as King's is already doing – high-level academic interactions with these countries. To this end, the College has initiated major collaborations during the past year with Hong Kong University and Tsinghua University in Beijing (see page 8).

We are also committed to enhancing the experience of undergraduate students at King's, and I was very pleased that for the examination period this year we were able to open two of the College's libraries 24 hours a day, seven days a week, in response to student demand. Student achievements this year include the award of the MBE to one of our graduate students in the Birthday Honours List in June (see page 6), while the report of the President of the Students' Union on pages 44-45 shows an extremely productive year there, and the feature on pages 46-51 illustrates the many successes of our Law students in recent mooted competitions. It is pleasing that King's continuing progress in



Among the visitors to King's this year were the US Ambassador, Robert Tuttle (second left, with the Chairman of Council, Lady Rawlings, next to him) and Mrs Tuttle; the President of Liberia, Ellen Johnson-Sirleaf and the Prime Minister:

providing access to higher education for students who might not normally consider a university education is now consolidated by the College's leadership of a new Lifelong Learning Network for South East London.

This has also been a bumper year for 'third stream' or 'knowledge transfer' activities, and at the end of 2005 we celebrated the success of Professor Peter Jenner and the team of the spin-out company Proximagen in winning the first *Times Higher Education Supplement* Business Initiative of the Year competition (see page 8). The new Strategic Plan envisages continued and increased investment in the College's business development and research support arm, King's College London Enterprises (KCLE), in order to build and increase income from our successful third-stream activities.

Visits and visitors

World-class ambitions imply close interaction with the world beyond the UK, and this year there have been visits by the Chairman (Lady Rawlings), the vice-principals and myself to countries including Australia, China, Hong Kong, India, Malaysia, Singapore and the USA. I have signed major agreements with Keio University in Japan and the University of North Carolina at Chapel Hill (see page xx). In November the Chairman and I made a particularly interesting

visit to Brunei, returning that of the Sultan and Queen Saleha to King's last year for their daughter's graduation.

This has also been a year in which King's has welcomed a particularly distinguished range of visitors. The Prime Minister came to give the College's Commemoration Lecture in June (see page 6), and we have also welcomed the Secretary of State for Defence, the Minister for Higher Education, the Archbishop of Canterbury (who is the College's official Visitor), our Nobel prize-winning alumnus former Archbishop Desmond Tutu, the President of Liberia (Africa's first female head of state), the US Ambassador to London, Robert Tuttle, and Mrs Tuttle, Bob Geldof, Rory Bremner (also a King's alumnus) and Stephen Fry – and, of course, Her Royal Highness The Princess Royal who, in her role as Chancellor of the University of London, opened the refurbished south range of the Main Building at the Strand in May (see pages 12-19).

Such visits attest to the national and international prominence of the College, and also to its location within a mile of the seat of government, in the centre of arguably the world's leading cultural and arts quarter, and at the heart of one of the greatest cities of the globe. We are already capitalising on our position in London to emphasise this worldwide dimension of King's, and we will be seeking in the years ahead to

It is entirely appropriate that King's has now acquired from the Privy Council power to award its own degrees, while remaining an active college of the University of London.

make even more of our position as a world-class university in a world-famous location.

This has been another busy year in the development of the College's estate (see pages 12-19). Fundraising will continue to play a major role in this and in the College's progress towards world status in general. As noted in last year's REPORT, our first development campaign raised £44 million, and I am delighted that we are now poised to launch a second, more ambitious, campaign.

Funding

More generally, funding remains an issue, for King's as for all the UK's leading universities. The 'top-up' fees to be phased in from September, capped at £3,000 until at least 2009, will definitely not bridge the gap between our current resources and the funding demanded by our world-class ambitions. This shortfall, in the context of the underpayment of university employees, provided the background to industrial action, at King's as elsewhere, by the former Association of University Teachers. Thanks to the good sense of the King's community, the College escaped far more easily than most in terms of the effect on examinations, marking and the processing of degree results. Happily, a settlement has now been reached.

Events such as these emphasise the desirability of excellence in the College's internal communications, and the need to build on the considerable strengths King's already has in this area to increase the extent to which staff are informed about, and able to influence, College policies, and aware of key messages. We have already begun to give profitable attention to both this area and to the crucial one of the external image or 'branding' of King's,

and this will continue in the coming year.

The greatest surprise this year has been the large amount of my time absorbed by the affairs of the University of London, which has been a very loose federation since the reforms of 1994. While we at King's regret the imminent withdrawal of Imperial College from the University, we will of course continue to collaborate with Imperial. Moreover, 19 Colleges will remain in a University which is reforming itself in a determined way. Quite apart from its persisting repute abroad, the University has a major research library (complementary to our own) and a series of research institutes which are both of considerable importance to our academics in humanities and social sciences.

It is entirely appropriate that King's has now acquired from the Privy Council power to award its own degrees, while remaining an active college of the University. After all, King's has been providing high-quality teaching and research for over 175 years, and for over half that period the College has *de facto* been awarding its own degrees. Our acquisition of degree-awarding powers follows a very positive report on the College's governance processes by the Quality Assurance Agency for Higher Education (QAA), which observed no fewer than 84 of our meetings. Their vote of confidence was not entirely unexpected, and it was a welcome recognition of the strength of the College's administration as we marked the retirement of Harry Musselwhite as College Secretary and Head of Administration after more than 35 years of distinguished service to the College and predecessor organisations, and the appointment of his successor, Ian Creagh, currently University Secretary of City University. Harry continues part-time as Director of Employee Relations.

DOMINIC TURNER



News in brief 2005-6

Blair gives keynote

The Prime Minister gave a major policy speech as the King's Commemoration Oration in June 2006. Speaking on Africa and climate change to an audience including Bob Geldof, Tony Blair announced a new body to monitor the progress of pledges made at the July 2005 G8 summit, to be chaired by UN Secretary-General Kofi Annan. The Commemoration Oration has previously been delivered by many famous speakers including King's alumnus, Nobel Prize-winner Desmond Tutu.



Blair announces new body on Africa.

Four MRC centres

King's status as the leading university in the UK for biomedical research was boosted in September 2005 when the Medical Research Council (MRC) announced the establishment of two new major centres at King's. The College now has four MRC centres: a quarter of those in the UK, more than any other university. They are researching the allergic mechanisms of asthma and of neurodegeneration; social, genetic and developmental psychiatry and neurodevelopmental biology.



Professor Tak Lee, Director of the new MRC Centre in Allergic Mechanisms of Asthma.

Bumper honours crop

Several King's staff, students and alumni achieved honours in the Queen's Birthday list in June 2006. Professor Jinty Nelson FBA, one of the country's leading medieval historians, became a Dame Commander in recognition of her services to history. Professor Cathy Warwick, Honorary Professor of Midwifery, was awarded a CBE for services to healthcare, while Linda Nazarko, Visiting Nurse Lecturer, gained an OBE for services to elderly people. Katherine Grainger, Olympic silver medalist and King's Law PhD student, became an MBE for services to sport.



Professor Jinty Nelson FBA DBE.

Gates funds HIV research

King's has been awarded funding by the Bill & Melinda Gates Foundation for research into HIV vaccines, as part of a \$287 million international initiative. The main King's grant is for a novel approach, led by Tom Lehner, Professor of Basic and Applied Immunology at King's, using the body's own HLA proteins to induce a powerful immune response to HIV. Another team at the College, headed by Dr Linda Klavinskis of the Department of Immunobiology, will be working with Imperial College London on developing a vaccine skin 'patch' using polymer-shielded 'stealth' viral vectors.

7/7: one year on

King's academics were in great demand from the media as commentators on the London bombings of 7 and 21 July 2005, and in August that year the College's Centre for Defence Studies produced a briefing paper which assessed the terrorists' strategy and the likelihood of further attacks. A year later, in July 2006, a new

assessment by King's Centre for Cultural Environment and Centre for Defence Studies looked at the events of the year and questioned whether the necessary lessons had been learned and reforms implemented. The research revealed that, paradoxically, society has generally been considerably less agitated about the threat and the aftermath than the government has.

SARAH BROMLEY



Professor Michael Clarke talks to the media about 7/7.

Future of the monarchy

When Prince Charles succeeds to the throne he is likely to become involved in politics in a manner quite unlike his mother, according to a book published in July by Robert Blackburn, Acting Head of the School of Law and Professor of Constitutional Law at King's. *King and Country: Monarchy and the Future King Charles III* considers a wide range of questions such as how the establishment united in support of Prince Charles's marriage to Mrs Parker Bowles, in contrast to Edward VIII's enforced abdication; what the powers and

ROBERT BLACKBURN KING AND COUNTRY

MONARCHY AND
THE FUTURE KING
CHARLES III



duties of the future King will be; the scope for royal intervention in matters of politics, and the growing popularity of Prince William and the constitutional possibilities for him succeeding Elizabeth II.

Bucking admissions trend

Figures released in February 2006 showed that the number of undergraduate students applying for entry to King's in 2006 rose by an impressive four per cent. This compared with a drop of 3.4 per cent across UK higher education, reflecting the introduction of 'top-up' fees in autumn 2006. The number of overseas applications to the College also increased by nine per cent, whereas these applications decreased nationally by 4.3 per cent.



Applications to King's rose by four per cent, while falling nationwide.

King's goes green

King's is one of the first UK universities to have 100 per cent of its contractual electricity supply sourced from environmentally friendly large-scale hydro generation. The College will no longer consume fossil fuel but will use green electricity across all its campuses, saving the emission of 37,700 tonnes of carbon dioxide into the atmosphere (equivalent to 215 return trips to the moon in a family car, or 4,100 journeys around the world).



Hydro generation provides 100 per cent of King's electricity.

SCOTTISH AND SOUTHERN ENERGY

JULIAN ANDERSON

Links to the East ...

King's has formed collaborative agreements with the universities of Keio (Japan), Hong Kong and Tsinghua this year. A memorandum of understanding was signed with Keio in November, and as a first step Japanese students will join King's Department of Classics in 2007. The HKU agreement was signed in May in the presence of Bill Rammell, Minister of State for Higher Education and Lifelong Learning, and will encourage the exchange of academic staff and students. In June the Principal visited Tsinghua in northwest Beijing and signed an agreement whereby Tsinghua and King's will exchange LLM students to study English and Chinese Law, and King's will provide a scholarship each year for a Tsinghua student.

... and to the West

King's has also signed contracts with ETH Zurich to provide master's studies in security policy there, and with the Faculty of Law at the University of Zurich. In February the College formed a wide-ranging strategic alliance with the University of North Carolina (UNC) at Chapel Hill: one of the leading universities in the world and the first chartered



Professor Peter Jenner and Ken Mulvaney of Proximagen.

state university in the USA. The agreement is initially between the School of Humanities and the Departments of Geography and War Studies at King's and the College of Arts and Sciences at UNC, but it is hoped that it will extend in due course to Health and other disciplines.

Proximagen scores

King's drug discovery company Proximagen Neuroscience won the 'Business Initiative of the Year' category in the first *Times Higher Education Supplement* awards in November 2005. Peter Jenner, Professor of Pharmacology,

The Principal and Lady Rawlings with Professors Taro Nishimura and Takami Matsuda of Keio University.

established the company to seek new treatments for Alzheimer's and Parkinson's disease and in 2005 Proximagen was floated on the Alternative Investment Market, raising £13.5 million. It is now valued at £30 million. Dr Patricia Reynolds, Senior Lecturer in the King's Dental Institute, was also a shortlisted finalist in the 'Imaginative Use of Distance Learning' category.



The College has gained degree-awarding power from the Privy Council.

Degree powers

King's was awarded degree-awarding powers in its own right by the Privy Council in July. Currently King's awards degrees of the University of London under a delegated authority, as do all the other London colleges. The University, which is undergoing a fundamental review of its governance structures, has actively encouraged individual colleges to seek their own degree-awarding powers, and King's, the LSE and University College London have been successful in achieving such powers. The award of the powers followed detailed scrutiny of the College by the Quality Assurance Agency.



He's a jolly good Fellow

Two King's staff achieved the pinnacle of academic distinction this year. Peter West, Professor of Theoretical Physics in the Department of Mathematics, was recognised for his exceptional contribution to science when he was elected a Fellow of the Royal Society in May 2006. In June Avshalom Caspi, Professor of Personality Development at the Institute of



Fellowships for Avshalom Caspi (above) and Peter West (below).

Psychiatry, was awarded the Fellowship of the British Academy, the national academy for the humanities and the social sciences. Professor Caspi is internationally renowned for his research on the development of antisocial behaviour in adolescents.

Anti-doping contract

One year on from the decision to hold the 2012 Olympics in London, King's Drug Control Centre was awarded a five-year contract to undertake the drug testing of athletes under the UK Sport Anti-Doping Testing Programme. The Centre will carry out both in-competition and out-of-competition testing to detect banned substances. The Centre has extensive experience in successfully delivering anti-doping analysis for major games and was the first laboratory to develop tests for amphetamines, anabolic steroids and growth hormones. The Centre's Director Professor David Cowan assisted with the London bid for the Olympic Games and sits on its Medical Advisory Committee.



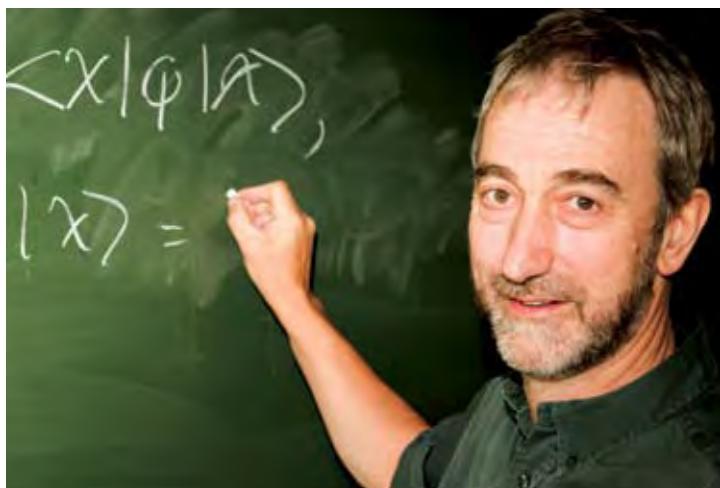
Second-year student Joanne Li Shen Ooi met Tony Blair at 10 Downing Street.

International shine

A King's second-year medical student from Malaysia won the London region prize in the British Council's International Student 'Shine' Awards in April 2006. Joanne Li Shen Ooi received a prize of £1,000 for her letter explaining how she is maximising her opportunities to enhance her life as an international student. She was also invited to a reception with Tony Blair at 10 Downing Street.

New aptitude test

King's will be one of 23 British universities using the UK Clinical Aptitude Test (UKCAT) to select candidates to study medicine or dentistry from 2007. The College currently has approximately 5,800 applications for 410 places in medicine and some 1,200 for 180 places in dentistry each year. UKCAT is a 90-minute test that requires no specific preparation, since it assesses a wide range of general skills and attributes rather than strictly academic achievement, and it will assist universities in creating a level playing field for applicants from diverse educational and cultural backgrounds.





The British Museum.

Arts and humanities awards

The College was a major winner of the 2006 Arts and Humanities Research Council collaborative doctoral awards, which aim to improve support, training and development opportunities for graduates and to promote collaboration between academics and the cultural and creative industries. The English Department will work with Shakespeare’s Globe Theatre and the Imperial War Museum; the Classics Department with the British Museum, and the Department of Geography with the Museum of London.



King’s studies have found no evidence of an ‘Iraq War Syndrome’.

Congress visits King’s

The Director of the Stem Cell Biology Laboratory at King’s and his colleagues gave an overview of their work to US Congressional leaders in June. Dr Stephen Minger explained that his team has now derived three stem cell lines, including one which contains the most common mutation of the cystic fibrosis gene. King’s is a UK leader in stem cell research, building on the College’s historic role in the discovery of the structure of the DNA molecule in 1953, for which Professor Maurice Wilkins received the Nobel Prize.

No ‘Iraq War Syndrome’

Studies by the King’s Centre for Military Health published in *The Lancet* in May 2006 have found no evidence of an ‘Iraq War Syndrome’ similar to that after the 1991 Gulf War. The results may reflect better health surveillance, improved communication within the Armed Forces and changes in the way in which medical counter-measures, such as vaccinations, were used.



Top: A 3D reconstruction of the Pagoda at Kew created by the Centre for Computing in the Humanities at King’s. Above: Archbishop Tutu at King’s.

Tutu goes digital

King’s is currently raising funds to enable the College to work with South African universities and others to create a digital archive of the writings, recordings and personal papers of King’s alumnus Desmond Tutu, which chronicles one of the most powerful and dramatic periods of South Africa’s history. Through this project, the world-class expertise of King’s Centre for Computing in the Humanities (CCH) will enable Tutu’s work to become

KING’S VISUALISATION LAB

DOMINIC TURNER

available for free access via the internet, creating the first digital archive for an African leader. Another recent CCH project enables visitors to the Royal Botanic Gardens, Kew, to see the historic landscape and its buildings through 3D reconstruction.

High student satisfaction

King's was one of five universities shortlisted for the 'University of the Year' title in the *Sunday Times* University Guide 2006. The survey also ranked the College fourth in London and concluded that King's 'enjoys by some distance the highest levels of student satisfaction with teaching quality and learning resources of any institution in the capital'. It also noted that the College was in the top seven universities for the employability of its graduates. Compiled using data from the Higher Education Statistics Agency, the Quality Assurance Agency and the national funding councils, as well as assessments by head teachers, the Guide ranked universities for teaching excellence, student satisfaction, research quality, A- and AS-level grades achieved by entrants, graduate employment, first and upper second degrees awarded, student: staff ratios and dropout rates.

Global teeth taskforce

Colgate-Palmolive celebrated its 200th anniversary in early 2006 by announcing its special support for the Global Child Dental Health Taskforce, spearheaded by Professor Raman Bedi of King's Dental Institute. The Taskforce is supported by the World Health



Above: Dr Mark Miodownik. Right: A green fluorescent vase from the exhibition.

Organization and receives funding from national governments. Professor Bedi's team is involved in establishing national groups to improve children's oral health in 10 countries including the UK, India, China, Mexico and South Africa, and within two years will expand to 30 countries, reaching out to around 500 million children and their parents across the world.



King's is leading a global taskforce for children's teeth.



Essence of fluorescence

The retrospective exhibition for American artist Dan Flavin at London's Hayward Gallery drew huge crowds early in 2006 to see artworks formed from fluorescent lighting tubes. Working with artist and PhD student Zoe Laughlin, Dr Mark Miodownik, Lecturer in Mechanical Engineering at King's, designed and created an exhibition-within-the-exhibition which explored the phenomena of fluorescence, phosphorescence, bioluminescence and luminescence. Some of the exhibits came from the materials library Dr Miodownik is developing at King's. In June 2006 his achievements were recognised when he became the first member of King's staff to win a £10,000 National Teaching Fellowship from the Higher Education Academy.



TRANSFO

A major renovation has transformed the College's founding building at the Strand Campus.



RMATION

The new range was opened by HRH The Princess Royal, Chancellor of the University of London.



Left: The King's Building at the Strand in 1831. The architect was Sir Robert Smirke, who also designed the British Museum.

Right: The College commissioned photographer Rob Moore to record the work and people involved in the project.

The refurbishment of the South Range of the King's Building at the Strand is the latest phase of the College's £500 million renewal programme. This programme – the largest recently undertaken in any UK university – has already created new and refurbished buildings at all King's other major campuses. Now renovation has started at the Strand, home to the College's Schools of Humanities, Law, Physical Sciences & Engineering and part of Social Sciences & Public Policy.

This two-year, £40 million redevelopment of the historic heart of King's has restored many of the elegant features of the original 1830s building while providing first-class academic, meeting and social spaces for the whole College, together with new accommodation for the departments of War Studies and Geography.

Smirke

The King's Building at the Strand – now Grade I listed – was the College's first home, constructed between 1829 and 1831. The project was a prestigious one, and the College had to decline the offer of free architectural services from Sir John Nash, then working on Buckingham Palace,

in favour of those of Sir Robert Smirke, architect of the British Museum. This was because Smirke was already in charge of works for the College's neighbour, Somerset House, with which King's shares an impressive neoclassical frontage along the river Thames, as well as cultural and academic links.

In 1829, the College's location in the Strand was considered dangerously risqué. One newspaper fulminated that 'It is within about a five minutes' walk of five theatres, and of all the other sinks of iniquity which derive their support from these celebrated schools of Immorality'. The fact that King's is still within five minutes' walk of five or more theatres is now, however, one of its proudest boasts, and the College enjoys teaching and research links with several of London's theatres and other cultural organisations.

Smirke did a good job for King's, as did the original contractors. After driving in thousands of piles to stabilize the marshy site, they raised the building to the roofing stage in just over a year and fitted it out in another ten months, all for £64,000. Early prints show a handsome building of three storeys, overlooking a quadrangle providing play-space for the pupils of King's College School,

This two-year, £40 million redevelopment of the historic heart of King's has restored many of the elegant features of the original 1830s building while providing first-class academic, meeting and social spaces for the whole College.



Left: The renovation has provided new dining and social space in the historic Strand building.

Below: The new 250-seat lecture theatre reinstates the old theatre which was on this site.

Opposite page: Meeting areas are provided within the social space.



PHOTOGRAPHS: JULIAN ANDERSON



175 YEARS OF DISCOVERY

The King's Building at the Strand has one of the most distinguished scientific histories of any university building in the country. The pioneering books, discoveries and inventions which have originated here include:

- the second volume of Sir Charles Lyell's revolutionary *Principles of Geology*, published in 1832;
- the first constant voltage electro-chemical battery, constructed by the College's first Professor of Chemistry, John Frederic Daniell, in 1836;
- the first electric telegraph, developed by Sir Charles Wheatstone and demonstrated in 1837;
- Maxwell's Equations, describing electro-magnetism, devised by James Clerk Maxwell when Professor of Natural Philosophy at King's in 1865;
- the Nobel prize-winning work of Charles Barkla on X-rays, and of Sir Owen Richardson in thermionics, in the first and second decades of the twentieth century;

- the discovery of the ionosphere and of Appleton's layer of the atmosphere by Sir Edward Appleton in the 1920s and 1930s;
- the groundwork for the discovery of the structure of the DNA molecule carried out by Maurice Wilkins, Rosalind Franklin and others in the early 1950s;
- important contributions to theory of general relativity by Sir Hermann Bondi in the 1960s and 1970s.

Also based or educated here were:

- Professor FD Maurice, founder of Christian Socialism and of the Working Men's College in the mid-nineteenth century
- John Ruskin, artist and critic
- novelist Thomas Hardy
- Michael Collins, Irish revolutionary leader
- Professor Sir Israel Gollancz, founder of the British Academy
- Sir Ivion Macadam, first president of the National Union of Students
- science-fiction writer Arthur C Clarke
- Thurston Dart, pioneer of early music.

which was housed in the basement until it moved out to Wimbledon in the 1890s.

Mezzanines

The building has, however, been extended many times since the 1830s, involving substantial internal modifications and the addition of further floors inside and at roof level, in order to cope with dramatic increases in the number of staff and students. By the 2000s, with 7,000 people using the campus, these additions and modifications – part desperation, part inspiration – had compromised many of the original spacious interiors, affecting the building's structure and fabric and impairing the effectiveness of the circulation routes.

The refurbishment, which has been assisted by capital grants from the Higher Education Funding Council for England, has resolved these problems by removing mezzanine floors and internal obstructions and improving access for all staff and students. The need to change levels as people walk around the building has been



OTHER BUILDING PROJECTS

New building and refurbishment continues at King's other campuses. Under development this year was the new £25 million Centre for Cell & Integrative Biology at the Denmark Hill Campus: an international centre focused on stem cell research in cardiovascular disease, organ transplantation and neurodegenerative disease, which will house 180 scientists from the School of Medicine and Institute of Psychiatry. At the Guy's Campus, the new Henry Wellcome laboratories for Medical & Molecular Genetics were opened in November 2005. Based over three floors in the Guy's Tower, they provide state-of-the-art facilities for studying the genetic basis of diseases ranging from breast cancer to high blood pressure. This refurbishment was funded by grants totalling £9 million from the Wellcome Trust and the Guy's and St Thomas' Charity. The Main Building of the Institute of Psychiatry, also at Denmark Hill, is currently undergoing a major refurbishment, of which the first phase is now completed and the second phase is underway.

NEWBERRY SMITH PHOTOGRAPHY



reduced, the location of activities has been rationalised, and a natural ventilation strategy has been adopted for most areas. The Portland and Yorkshire stone and Scottish granite of the building, directly ferried in by river in 1829, has now been restored and cleaned, and the new materials (natural and stained oak, stone and bronze) have an empathy with the existing ones. More than 80 per cent of the material from the demolished parts of the building has been recycled elsewhere, and, with advice from Greenpeace, the new wood was sourced from sustainably-sourced woodland.

Heritage organisations have welcomed the refurbishment as an imaginative yet sensitive response to what can again be seen to be a very fine building, as the remarkable photographs taken during the reconstruction by Rob Moore help to demonstrate. Altogether, the South Range now provides a learning environment of the highest quality, to meet King's mission as a world-class, research-led university institution.

Spaces

A major purpose of the project is to provide new teaching, social, dining and meeting facilities for the whole of the College. Many of the activities which are now at King's other campuses – such as medicine, health and life sciences and education – were once taught in this building, as evidenced by the old Anatomy Dissecting Room which has now been converted to a study space for graduate students. For teaching, the project has provided five new seminar rooms and a 250-seat lecture theatre, which reinstates the old theatre formerly on this site. On the social side, there are spacious new dining and social facilities for students, staff and guests in a suite of interconnected areas, including a comfortable new common room for staff and research students, which is a focal point for meeting in the heart of the campus. The River Room provides elegant space for private functions, with a magnificent view of the Thames.

Above this, floors four to seven have been converted to provide purpose-designed, flexible

The College's £500 building renewal programme is the largest recently undertaken in any British university.

NEWBERRY SMITH PHOTOGRAPHY



Far left and left: **The Centre for Cell & Integrative Biology at the Denmark Hill Campus.**

office space for more than 65 staff in the departments of Geography and War Studies, together with meeting rooms, administrative offices and kitchen facilities. Structural alterations here connect previously disparate areas, and skilful and extensive use of fully-glazed partitions brings natural light deep into the building. Throughout the project, a priority has been to design and improve facilities to accommodate people with a range of disabilities.

Many of the rooms in the new social spaces are of double height, and will make magnificent display areas for artworks of various kinds. Long-term loans have already been negotiated with Arts Council England.

Future

The next phase of redevelopment for the Strand Campus – a £20 million programme to provide laboratories, student work areas and staff offices, mainly on the upper floors of the King's Building and in the Strand Building – is already underway.


PARTNERS AT THE STRAND

The College has been represented throughout by a Project Board chaired initially by Professor Barry Ife, now Principal of the Guildhall School of Music and Drama, and latterly by Professor Colin Bushnell, Assistant Principal (Estates). The College's Estates Department also made a major contribution, particularly Ian Caldwell, Director of Estates, and Alan Gibbs, Project Manager.

Architect & engineer:	Building Design Partnership
Contractor:	Bovis Lend Lease
Project Manager:	Gardiner & Theobald Management Services
Cost consultant:	Clarus Consulting
Financial advisor:	Ernst & Young

THE PLAY'S THE THING

Professor Ann Thompson has co-edited a new, ground-breaking Arden edition of *Hamlet*, launched in April at Shakespeare's Globe Theatre in London. This is the first edition to edit separately all three texts of the play published in the early seventeenth century. REPORT asked Professor Thompson about the new edition and her experience in preparing it.



Hamlet watches the King attempting to pray, in Yuri Lyubimov's 1989 production. As with many Soviet productions, this cast Hamlet as a dissident in a totalitarian state.

PHOTOGRAPH: STUART MORRIS

Report What is the difference between this edition of *Hamlet* and previous editions?

Ann Thompson All previous editors have either chosen a single text to edit or, more often, have put together a combined or ‘conflated’ version of the two longer texts. This edition is the first to offer all three of the early texts (the First Quarto published in 1603, the Second Quarto published in 1604 or 1605 and the First Folio published in 1623) accompanied by the wealth of introductory matter, annotations and appendices that people expect from the Arden series. Moreover, my co-editor, Neil Taylor, and I have tried to remain ‘agnostic’ about the origins of the three texts and the relations between them, not dismissing the 1603 text as simply ‘bad’ and not feeling obliged to argue that the 1623 text is a revision of the 1604/5 text.

R Why do you think we need this kind of edition?

AT Because it seems that from the very beginning – the play was probably first performed around 1600 – there was no such thing as a single text of *Hamlet*, but rather a number of versions which can and perhaps should be seen as different plays (or different versions of the same play). We aren’t saying to our readers ‘Here is the right text of *Hamlet* at last’, but ‘Here is all the evidence and here is why there is no such thing as the right text’.

R Can you give some examples of the differences between the three early texts?

AT At the Globe launch, we were very fortunate to

‘To be or not to be’, the most famous speech in this very famous play, occurs in the equivalent of Act 2 in the 1603 text, some 500 lines earlier than in the other texts.

have two actors, Sam West and his mother, Prunella Scales, who performed some extracts to illustrate major differences. They did a scene between Hamlet’s friend Horatio and the Queen, Hamlet’s mother, which is found only in the 1603 text. This scene compresses information about Hamlet’s aborted voyage to England found in three different scenes in the other texts. More importantly, it makes explicit the Queen’s support for her son and her knowledge of her husband’s plot to have him killed – matters which are left uncertain in the other texts. Sam West also performed Hamlet’s last soliloquy, ‘How all occasions do inform against me’, which is found only in the 1604/5 text when Hamlet encounters a Norwegian Captain and asks him about the army of Fortinbras. Hamlet does not appear at all in this scene in the 1603 text or in the 1623 text.

Another example would be the placing of ‘To be or not to be’, the most famous speech in this very famous play, which occurs in the equivalent of Act 2 in the 1603 text, some 500 lines earlier than in the other texts. This text also has some unique stage directions, such as ‘Enter the Ghost in his night gown’ in the closet scene, which gives a very different impression of Hamlet’s father than the ghost in armour in Act 1 in all three texts.

R How do you think these differences came about?

AT The texts of plays were probably not very stable in the early seventeenth century. About half of Shakespeare’s plays were published before the ‘complete works’ volume (the First Folio) in



ARDEN SHAKESPEARE

The Arden Shakespeare edition is published in two volumes: the core volume (*Hamlet*) gives readers the Second Quarto text of 1604/5. As well as a full, illustrated introduction to the play’s historical, cultural and performance contexts, the volume contains an appendix of the additional passages found only in the 1623 text. The other volume (*Hamlet: The Texts of 1603 and 1623*) is a companion to the core volume which contains the First Quarto text of 1603 and the First Folio text of 1623. Its introduction contains the fullest available stage history of the First Quarto text. The new edition was launched at Shakespeare’s Globe Theatre on 19 April, when Ann Thompson and Neil Taylor gave the Sam Wanamaker Fellowship lecture, ‘Hamlet in his Multiple Texts’.

Ann Thompson and fellow Arden *Hamlet* editor Neil Taylor used this cartoon of 1804, showing actor John Philip Kemble with the child prodigy actor Thomas Betty on his back, as a way of illustrating the burden actors feel when they tackle the role of the Prince.



1623 and they all have both major and minor differences. Different versions were probably performed as well as published; membership in acting companies changed, as did acting spaces. Contrary to the consensus amongst many recent scholars, Shakespeare does seem to have had an interest in his plays as literary texts for reading as well as scripts for performance and he regularly wrote versions too long for performance. He also seems to have engaged in re-writing his own

work, and other people may have intervened in the complex process of transmission from Shakespeare's study or his stage to the published texts that survive today.

R What difference does it make to performances of *Hamlet* which text is used?

AT Most people probably don't notice. One student taking my MA course on *'Hamlet and its afterlife'* was brave enough to confess that she had seen



*"To run on May 3rd or not to run on May 3rd."
Evening Standard 16 March 2001.*

and enjoyed the Red Shift production of 1999-2000 called *Hamlet: First Cut* without realising that she was watching a performance of the 1603 'bad' quarto which is only half the length of the other texts. Many actors and directors have however adopted this text's placing of 'To be or not to be' on the grounds that it is more logical to have it come before Hamlet has formulated his plan to have the actors perform the 'play within the play' – 'The Murder of Gonzago'. Given the length of both of the 'good' texts, every production makes its own cuts and rearrangements according to their interpretation of the play.

R Do you have a favourite production of the play? And a favourite actor in the part?

AT I've been lucky to have seen a large number of productions and have enjoyed most of them. I always hope the next one will be even better than the last and my hope was vindicated recently, on 29 April 2006 at Stratford-upon-Avon, where I saw the visiting production by the Baxter Theatre Centre of South Africa, directed by Janet Suzman. This was a very powerful production with strong performances all round, especially from Vaneshran Arumugan as Hamlet and Roshina Ratnam as Ophelia. Over the last decade or so, I have admired Simon Russell Beale, Alan Cumming, Alex Jennings, Michael Maloney, Mark Rylance, Toby Stephens and Sam West. My favourite film would have to be the 1920 silent

Below left: This cartoon shows how the representation of Hamlet with a human skull is so well known that it can readily be parodied. In this case, the Prince/Prime Minister holds a sheep's skull, alluding to the debate over the

date of the 2001 general election which was threatened by the outbreak of foot-and-mouth disease.

Right: Henry Irving devised stage business to encapsulate Hamlet's complex psychological state.

version made in Germany with Asta Nielsen playing a female Hamlet.

R What would Shakespeare have thought of your edition of the play?

AT What would he have thought of the entire modern Shakespeare industry? I hope he would be pleased that so many people have continued to perform, read and discuss this play more than 400 years after he wrote it. I hope he would enjoy the sheer range of performances and interpretations we cover.

R How did you set about producing this edition?

AT We began by editing the first version of the play to be published, the 1603 First Quarto (Q1), the so-called 'bad' quarto, partly as a way of defamiliarising ourselves with the play: Q1 is *Hamlet* but not as we know it. As with any edition, you have to go back to the earliest texts and work on them as if no-one has edited them before, making decisions about punctuation, for example, and deciding what needs glossing and annotation. We wanted the edition to be particularly aware of the play in the theatre and we tried to draw on performance beyond the Anglo-American tradition as *Hamlet* has become an international if not global phenomenon.

R What were the particular problems and challenges?

AT First, we had to persuade the Arden publishers and the other General Editors of the Arden series to let us edit all three texts. Then we had to work through the enormous quantity of previous editions, critical studies, accounts of performances, adaptations and offshoots and select what we could find room to include. And we had to keep ourselves going through a ten-year project during which we both had quite demanding day-jobs as Head of Department, Head of School or Dean.

R How did you choose the illustrations for the edition?

AT In the core volume, we tried to choose illustrations that seemed important for our arguments in the Introduction – for example we illustrated the burden actors feel when they



Hamlet (to Mr Irving): “*Nor do not saw the air too much with your hand thus; but use all gently; for in the very torrent, tempest, and (as I may say,) whirlwind of your passion, you must acquire and beget a temperance, that may give it smoothness.*”

tackle the role by using a cartoon of John Philip Kemble with his rival, the child prodigy Thomas Betty on his back (1804) and one of Edwin Booth being haunted by his actor father (1875). We illustrated changing attitudes to Ophelia before and after the famous painting by John Everett Millais, and we used a cartoon of Tony Blair to illustrate how Hamlet is often depicted saying ‘To be or not to be’ holding a skull, although the soliloquy appears in Act 3 (or in Act 2 in the 1603 text), while the skull does not appear until the penultimate scene.

SHAKESPEARE HIS BIOGRAPHY

King’s Department of English was joint organiser, with the National Portrait Gallery, of a conference in May which explored the events and relationships of Shakespeare’s life in the context of his work. Associated with a major exhibition of portraits and other objects related to Shakespeare and his time, the themes included portraiture and likeness, biography and custom, and theatrical cultures. Professor Thompson spoke on ‘*Hamlet in 1603*’, and Dr Sonia Massai of King’s on ‘The Good, the Bad and the Wise: The rise of Shakespeare in print’.

Another joint venture between King’s and the National Portrait Gallery in June saw five academics and biographers from the College discussing their work on London figures such as Dr Johnson, Samuel Taylor Coleridge, Ford Madox Ford, the Medieval Londoner Thomas Usk, and the Victorian cartoonist Linley Sambourne. A third collaboration, between Dr Elizabeth Eger of King’s and Dr Lucy Peltz of the Gallery, is creating an exhibition about eighteenth-century women entitled ‘Living Muses: Bluestockings in the Public Eye’, which will open in Spring 2008.



The ‘Chandos’ portrait, presumed to be Shakespeare, was the first painting given to the National Portrait Gallery in 1856 and is listed as number one in the gallery’s collection.

The second volume was more of a challenge: how can you tell from pictures which text is being used? But we focused on things like the scene and the stage directions unique to the First Quarto that I’ve already mentioned (the Ghost in his night gown, Ophelia with her lute) and on lines unique to the Folio text such as ‘Denmark’s a prison’ and ‘What, frightened with false fire?’.

R How do you feel now the job is finished?

AT I feel very relieved, though of course apprehensive about the reviews which are yet to appear. And it isn’t really finished in some ways: I gave a lecture on *Hamlet* at a conference at the National Portrait Gallery in May and I’m contributing to a panel on *Hamlet* at the conference of the European Society for the Study of Shakespeare (ESSE) in London later this summer. I’ve also been commissioned to write an entry on *Hamlet* for a Shakespeare encyclopaedia.

R What is your next project?

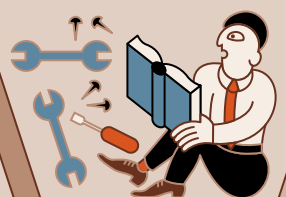
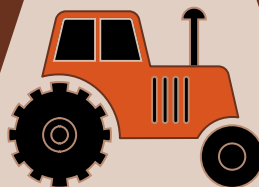
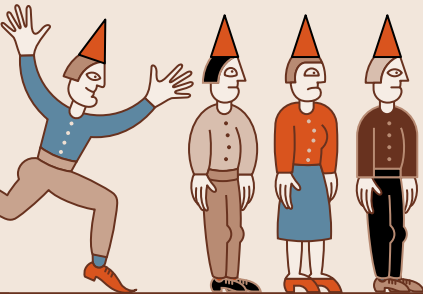
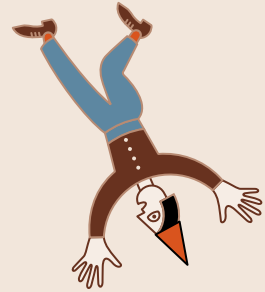
AT I haven’t decided yet, but it won’t be another edition (though I’ll continue in my role as a General Editor of the Arden series). I have two or three projects in mind but have been almost superstitious about committing myself until *Hamlet* was actually published.



NATIONAL QUALIFIC

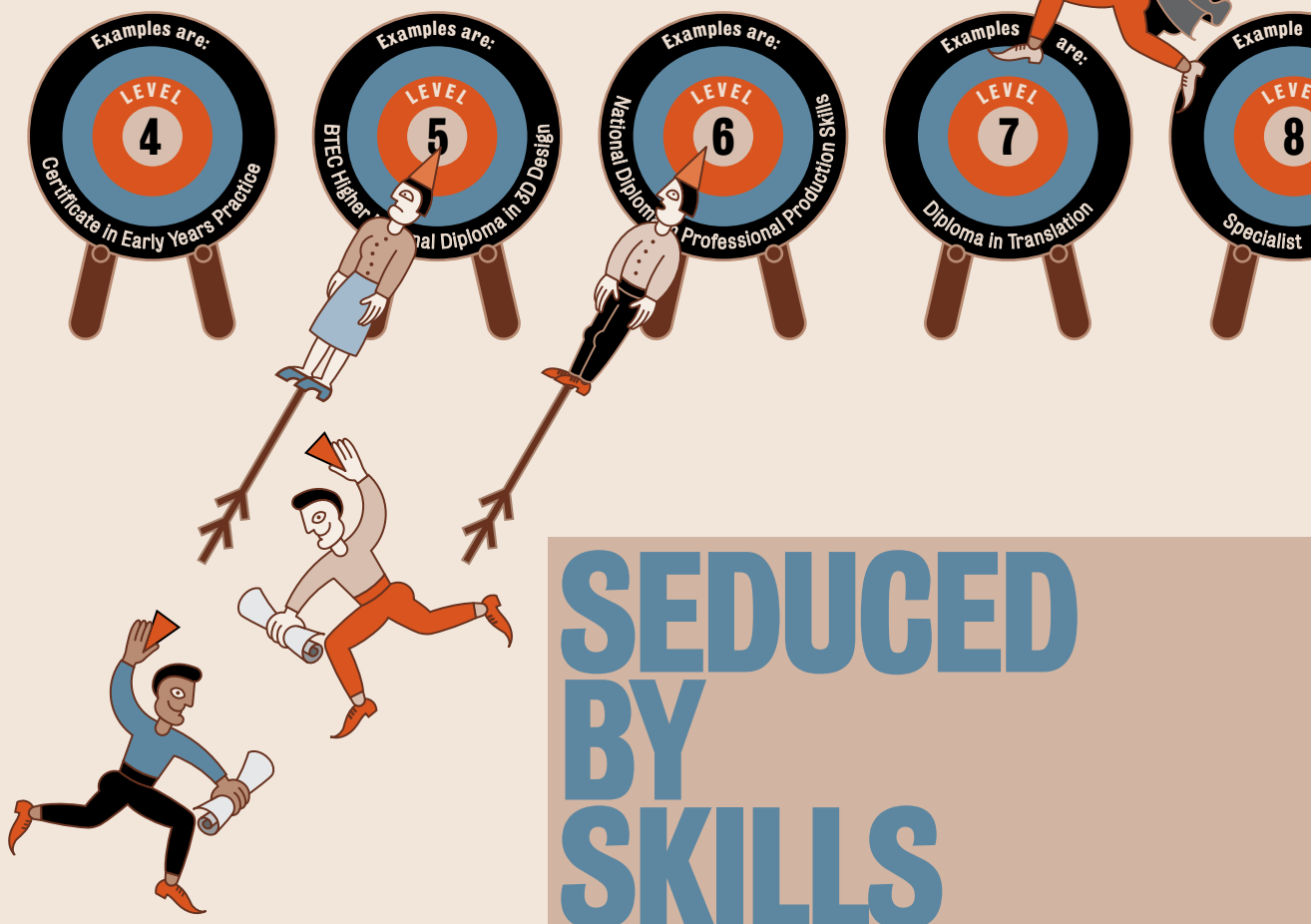


GOVERN- POLICY





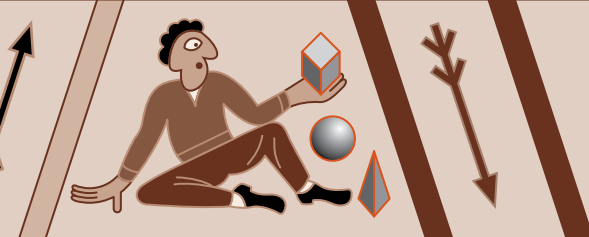
ATIONS FRAMEWORK



SEDUCED BY SKILLS TARGETS

Alison Wolf, the Sir Roy Griffiths Professor of Public Sector Management at King's, discusses governments' misguided obsession with formal qualifications.

ILLUSTRATION: TILLY NORTHEGGE



Government in the UK now spends about half of our annual national income; as indeed do the governments of most developed countries. Some of this is distributed directly in the form of cash benefits, but most of it goes on goods and services, including hospitals and GPs' surgeries, roads, rail, bus and tube subsidies, schools and, of course, universities.

The enormous scale of government spending is unlikely to change in the foreseeable future, which is why public policy has become such an important field of academic study, and why public services attract so much attention from social scientists. Unfortunately, effective policy-

making, whether by central or local governments, turns out to be very difficult. The current mantra extols 'evidence-based policy-making'; but the reality is that governments – like people everywhere – tend to ignore and deny evidence that casts doubt on their pre-existing beliefs.

In collaboration with colleagues at the University of London's Institute of Education, I have recently been examining a field which encapsulates the problems of policy-making and public management. For a good 20 years now, under both Conservative and Labour governments, there has been a concerted effort to increase the number of formal qualifications held by both young people and adults. To that end, the process of awarding qualifications has been progressively nationalised and centralised, with the sole exceptions of the university sector and some of the professions.

The funding of schools, further education and adult training has been linked to the number of formal qualifications that people in them obtain, and ministries and public agencies are given qualification 'targets' which they must deliver.



Obsession

Politicians' obsession with qualifications has two origins. First of all, they are easy to count, and therefore highly seductive as a management tool, and a way of holding publicly-funded institutions accountable if they do not produce enough, or the right sort, of 'educational output'. Second, they are seen as extremely important in promoting economic growth and productivity. Governments believe that the more formal qualifications school-leavers and adults obtain, the more skilled and the more productive the workforce will become.

In their growing preoccupation with 'skills', UK governments are part of a global trend. During the last quarter of the twentieth century, the education policies of European and North American governments became increasingly directed towards immediate economic goals, especially in the post-compulsory, further and adult sectors. However, the UK has been

distinctive in its heavy emphasis on formal qualifications and quantitative targets, tied to a new centrally controlled 'national qualification framework'. This categorises every academic or vocational qualification approved for use in a publicly-funded institution as belonging to a particular level (originally 1-5,

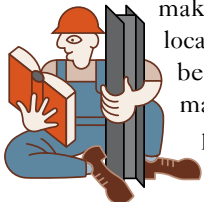


ILLUSTRATION: TILLY NORTHEGGE

The reality is that governments – like people everywhere – tend to ignore and deny evidence that casts doubt on their pre-existing beliefs.

and now 1-8). Targets are expressed in terms of these levels, even though qualifications at the same level can have very little indeed in common. Government priorities for further and adult education emphasise relatively low-level vocational qualifications (especially ‘level two’), and its funding agencies, with their own targets to meet, duly concentrate funding on programmes which deliver these. That is why, for example, so many adult education courses are losing funding at present.

Failing

Unfortunately, our research indicates that this policy is failing. Vocational qualifications are certainly being awarded in large numbers. When we examined the experiences of 1958-born adults who are tracked longitudinally through the National Child Development Study, we found that over a quarter had acquired a level one or two vocational (or ‘occupational’) qualification between ages 30 and 40. If government policy were achieving its aim, the adults who acquired these extra qualifications would be more productive and would therefore tend to earn more, holding other things constant, than those who did not.

But they do not. The low-level vocational awards to which governments have pinned such hope either have no impact on earnings at all or are associated with having significantly lower wages than comparable workers who did not acquire them. The only qualifications which raised the earnings of the 30-somethings who gained them were

academic and degree level (for men and women) or, for women only, higher level occupational awards, such as nursing diplomas.

Negative incentives

Of course, earnings and skills are not perfectly correlated. However, one reason that governments have such faith in qualifications is that graduates consistently earn more than non-graduates, and school-leavers with A levels earn more than those with just GCSEs. There are a number of reasons for this, including the fact that academic qualifications are a ‘signal’ of underlying ability, but also – and crucially – the demand of the British labour market for the sort of skills that academic study develops. The labour market also demands and rewards highly developed craft and technical skills: but it is being offered large numbers of ‘level one’ and ‘level two’ certificates, which count towards targets irrespective of their content. They also count irrespective of whether their holders actually increased their skills and knowledge in the process of gaining them.

Managing public services through quantitative targets always creates distortions and negative incentives. This is not a problem specific to the education field: it is also very evident in health. In the current case it is surely obvious that institutions will have a major incentive to steer people towards courses on which they are very likely to succeed and get the qualification. The problem is exacerbated by central government’s infatuation with





Graduates consistently earn more than non-graduates. However, low-level vocational or 'occupational' qualifications either have no impact on earnings or are associated with significantly lower wages than those of comparable workers who did not acquire them.

‘output based funding’, in which how much the institution (or ‘learning provider’) is paid depends on whether the learner gets the certificate. In other words, the less people have to learn, the more likely they are to pass, and the safer your funding will be.

These points have been made repeatedly by policy evaluators, and indeed the findings from our latest research underscore those of previous studies of further education and training on which I have worked – and which policy-makers have generally ignored. These indicate that, for example, central government’s efforts to make qualifications more ‘relevant’ to the modern workforce tend, instead, to create new, complex and expensive bureaucratic structures and leave employers largely bemused. Meanwhile, the despised ‘leisure courses’ offered within adult education (and whose funding is being reduced in favour of ‘training’) have measurable benefits in terms of people’s physical and psychological well-being.

Not working

Public management theory emphasises both the importance of understanding incentives, and the need for decisions to be made as close as possible to where a service is being delivered. In fact, that was one of the major points emphasised by Sir Roy Griffiths, after whom my chair is named, in his ground-breaking review of health service management. Current adult education and training



policy, by contrast, involves setting detailed objectives and procedures for the whole of a large and complex society.



This seems obviously misguided, and yet the practice continues year after year, in this and many other policy areas. Perhaps the small geographical size of England deludes Whitehall but I also think that government departments find it nearly impossible to recognise that an established policy is not working.

In the case of further education, giving adults genuine power to choose courses could transform the situation very quickly; and it is hard to see why society accepts that young undergraduates can make informed decisions about their studies, but not experienced adults. The difficult bit will be persuading governments that they cannot buy growth through centralised skills planning.

● *‘Certifying the workforce: an economic imperative?’ by Alison Wolf, Andrew Jenkins and Anna Vignoles is published in the Journal of Education Policy (2006). Further research in the field is described in Does Education Matter? Myths about education and economic growth (London: Penguin, 2002) by Alison Wolf. Professor Wolf has worked as a policy analyst in the US government, and she continues to undertake regular consultancy work for a range of government departments, here and overseas, and for professional and examining bodies. She is a Visiting Professorial Fellow at the Institute of Education and a Council Member for the United Nations University. As well as her mainstream research, which currently includes a large ESRC-funded study of government-funded training, she is Director of the College’s new MSc in Public Services Policy & Management, a regular writer for the general media, and a columnist for the Times Higher Education Supplement.*



**NIGHTINGALE,
SEACOLE**

AND

**NURSING
TOMORROW**



What do tomorrow's nurses have to learn from Florence Nightingale – or Mary Seacole? Professor Anne Marie Rafferty, Head of the Florence Nightingale School of Nursing & Midwifery, ponders the legacy of her famous predecessors.



COURTESY OF FLORENCE NIGHTINGALE MUSEUM TRUST, LONDON

'Florence Nightingale in the Military Hospital at Scutari.' Lithograph by JA Benwell, 1855.

The Florence Nightingale School of Nursing & Midwifery at King's occupies a totemic place in the nursing world. As the living emblem of its founder, it has much to live up to. And yet, although almost 150 years have elapsed since its founding, the issues it contended with are still very much with us today. How wide should the entry gate be? What are the characteristics of the good nurse? How can we judge and measure the quality of nursing care? These are questions which preoccupied the early reformers of nurse training and proved so controversial that the nascent profession nearly imploded under their weight.

Covert and clandestine

Florence Nightingale was a covert and clandestine commentator on all such issues. She was consulted as an expert witness and her opinion carried enormous weight. Nevertheless, she did so from a distance, as a reluctant heroine and patron of the Nightingale School. Shunning the limelight and blaze of publicity which followed her return from the Crimea, Nightingale might be considered an early victim of Victorian celebrity culture. But her response could also be regarded as pragmatic. Exhausted and ill, she retreated behind the shutters of her South Street residence, and this enabled her to pursue her cherished interests unencumbered by social obligations. There is more than a hint of the rebellious Jane Austen in Nightingale's spirited denunciation of the petty

restrictions upon women's lives in the pro-feminist tract *Cassandra* she wrote in her youth.

It is impossible to do justice to Nightingale's views on nurse training, but her position (shared by many educators at the time) was that education was a 'moral' process, involving the development of 'character' and self-control. However, training also involved intelligent observation, reporting and practical skill. Such skill was acquired by rotating round wards, taking charge during the head nurse's absence and 'specialing' acutely-ill patients on a one-to-one basis. In addition, probationers were encouraged to keep diaries of cases and record their notes from lectures and case illustrations given by medical staff. These rudiments of training would all be recognised today. Significantly, too, the 'fitness for practice' of probationers at the end of their training was as much a concern for Nightingale and her contemporaries as it is for us today.

Nightingale contended that clinical subjects, including nursing, could only ever be tested at the bedside by a 'matron' after she had had prolonged experience of an individual nurse. Drawing an analogy between nursing and the arts, Nightingale argued that a woman applying for the office of music teacher might be examined on the principles of harmony and certified if shown to know them thoroughly. But only a judge of music could comment on expertise. Nursing was not only an art but a character, which could not be arrived at by

examination. The quality of a nurse or matron therefore lay in her character, practical ability and her ability to give treatment. Lectures and making notes on cases were a legitimate, but only a small, part of the course of the nurse's treatment and examination.

Wary of 'bookish knowledge'

It is noteworthy that Nightingale is often called upon by contemporary critics of nursing education who argue that nursing has lost its way as a result of its entry into higher education. Nurses, they argue, are over-educated and have lost their ability to care. To be sure, Nightingale was wary of 'bookish knowledge', fearing that it would advantage only the 'forward' and prejudice the diffident. While she was adamant that clinical practice could only be observed by direct supervision of training, she never intended these

Nursing was not only an art but a character, which could not be arrived at by examination. A nurse's quality lay in her character, practical ability and ability to give treatment.

to be considered as mutually exclusive. But this is precisely what contemporary critics of higher education for nurses have seized upon in their attacks upon university education for nurses. They argue that cleverness and caring are incompatible in a nurse (although apparently natural counterparts in doctors). Having forsaken the practical skills of caring, today's nurses, it is contended, care only for fancy theorising. This conservative backlash has been highly effective in casting aspersions upon the value of better-educated nurses and their contribution to patient care. Paradoxically, it has been through investment in higher education for nurses and nursing research, in particular, that such charges have been refuted.

Evidence linking better-educated nurses with better outcomes for patients has been forthcoming from research in the USA. As part of

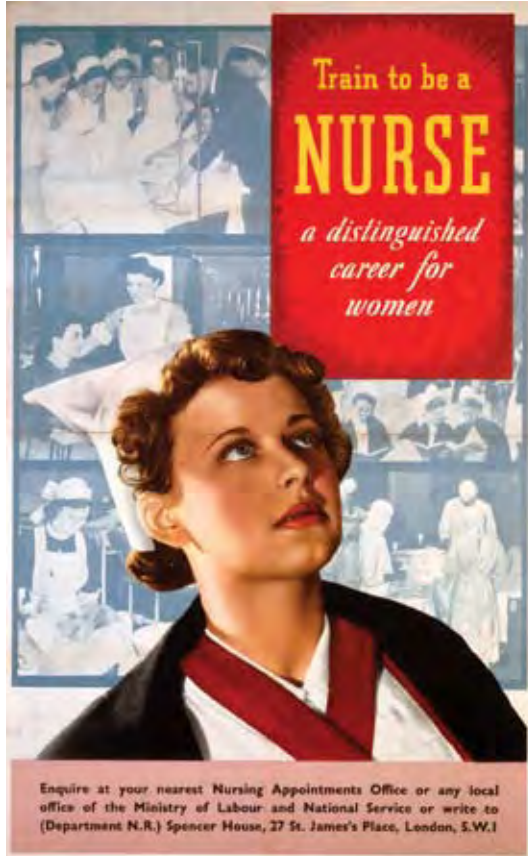
FLORENCE NIGHTINGALE 1820-1910

This photograph has recently been identified as a previously-unknown image of Nightingale, taken at her parents' home in Hampshire in 1858, two years after her return from the Crimea. The picture is in an album that was owned by William Slater, the chemist and amateur photographer whom Nightingale knew and trusted. It has now been given to the Florence Nightingale Museum at St Thomas', the hospital where Nightingale established her school of nursing in 1860, the direct predecessor of the current Florence Nightingale School of Nursing & Midwifery at King's.



**Ministry of Labour and
National Service poster
from the 1940s.**

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an international collaborative research effort involving five countries, I have been privileged to lead the UK contribution to this study, which has examined the links between nurse staffing levels and patient outcomes. Earlier findings published from the USA demonstrated that better nurse staffing levels in American hospitals had lower mortality rates for patients. Our study in the UK is the first to demonstrate a similar link in hospitals in England. Findings are scheduled for publication in Autumn 2006. The association between nursing and patient mortality was, of course, a subject dear to Nightingale's heart. Her *Notes on Hospitals* (1858) is a model of epidemiological analysis, and few have written more persuasively and compellingly on the subject than she has.

Notwithstanding the early gains in education for nurses, anti-intellectual prejudice and negative

attitudes towards improving educational opportunities for women have dogged the development of better education for nurses for decades. The gendered basis of the profession left it susceptible to criticism in terms of the supposed negative impact of higher education upon women's reproductive functions in the late 19th century. Critics, many of them prominent doctors, deplored the rise of the 'blue stocking'. They feared the impact it would have upon the fertility of the race. Over-excitement and strain upon her intellectual faculties could, they believed, make a woman inattentive to her personal attractiveness, 'unsex' her and render her fit only as a companion to philosophers. Sick nursing, it was argued, should be a prelude to marriage and maternity.

Seismic shift

Nursing has had to fight hard to find a place within the academy since these heady days of debate – but the battle is still far from won. Until the 1990s only a micro-minority of nurses were university educated. It was only with the change in government policy towards expanding higher educational opportunities, specifically for women and black and ethnic minorities, that the seismic shift in priorities occurred. But what is needed is not less, but greater, investment in higher education and research for nurses and midwives, and there is good evidence that such investment is worthwhile. Positive trends in quality improvement in nursing research have been identified in successive Research Assessment Exercises in the UK. The most recent demonstrated a clear increase in both the volume and quality of the research being conducted in university schools of nursing around the UK (as reflected in higher ratings) as well as an increase in the number of higher degrees completed and the number of nursing research students registered, adding to the national research capacity. Examples of high quality, cross-disciplinary research were also highlighted, and areas of particular strength in British nursing research included mental health, care of older people, cancer care, palliative care, pain management and maternity care.

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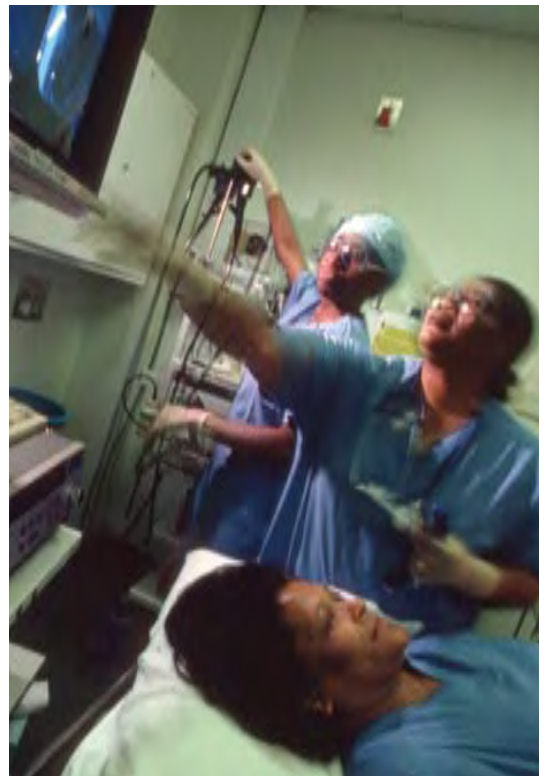


MARY SEACOLE 1805–81

Historians have pitted Nightingale against the Jamaican Mary Seacole, her supposed arch-rival in the Crimea. Nightingale is alleged to have snubbed Seacole, who came to the Crimea as an entrepreneur, setting up a 'hotel' for soldiers, proffering her own remedies and tending the injured in the field. However, although Seacole has been neglected as a historical figure she has now enjoyed renewed prominence. This portrait of Seacole was recently rediscovered after an art dealer bought a print in a car boot sale and found that its 'backing board' was actually a painted portrait. He sold it to another dealer who sent it to a historian working on women in the Crimean War, who at once

recognised it as Mary Seacole. She purchased it and generously placed it on long-term loan at the National Portrait Gallery in London. The portrait can be identified as Seacole through comparison with her one known surviving photograph, taken a few years later, which shows a very similar face. It is of the right age to be Seacole who would have been in her mid sixties when it was painted. The miniature medals worn in the portrait are recognisable as those for the British Crimea, the Turkish Medjidie and the French Legion of Honour, and Seacole was known to have received these honours. The red scarf she is wearing is an emblem of her Creole identity.

But it is not only Florence Nightingale whom we should look towards for inspiration in taking forward our leadership agenda for nursing education today. Historians have had a field day in pitting Nightingale against her alleged arch-rival in the Crimea, Mary Seacole. Allegations have been made that Nightingale snubbed Seacole, who set up a 'hotel' for soldiers and proffered her own remedies, tending the injured in the field. Seacole was very much the entrepreneur and, to be sure, she has been neglected as a historical figure, although she has now enjoyed renewed prominence. She was a truly remarkable woman. Her Jamaican roots made her stand out as a candidate for the Crimea. But although the voice of Mary Seacole deserves to be rescued from what E P Thompson refers to as 'the condescension of posterity', competitive rivalry lives more in the minds of historians and the media than it was in the minds of our two heroines of the Crimea. We need both of them as role models for nurses and midwives today. We need the intellectual rigour of Nightingale as much as the entrepreneurial flair of Seacole. The equation must surely be one plus one, rather than one minus one, for nursing and midwifery to thrive in the rapidly changing world of healthcare tomorrow.



Operating within a high-tech environment is a crucial part of professional nursing and midwifery today.

E-LEARNING FOR EXCELLENCE

VIVIEN WOODS, ERGON COMMUNICATIONS



**Videoconferencing to
a remote dental practice
for a telediagnosis
session.**



A recent review of King's pioneering computer-delivered and online learning in Dentistry and War Studies shows that the most compelling reason for developing e-learning in higher education is the positive impact it can have on teaching and learning.

Market-driven reasons for increasing the use of e-learning in higher education are not hard to find. Whereas in the early 1960s about six per cent of people in England aged between 18 and 21 went to university, today some 43 per cent of those aged between 18 and 30 can expect to benefit from higher education. University funding per student over this period has not kept up with this seven-fold increase in numbers, and new ways of teaching must be used to increase the efficiency of university teaching without reducing its quality.

Demographic and economic factors have also led to a wider variety of students. This includes mature learners unable to attend college every day; professionals wishing to improve their education while still working; overseas students who need to remain in their home country while studying, and students with special needs who find it difficult to attend college on a regular basis. Even resident teachers and students are required to be more mobile: to travel between university campuses, for example, or to spend time abroad or in professional practice placements. E-learning can help all these groups.

Policy rationale

Another commonly-cited 'policy' rationale for promoting the uptake of e-learning is the need to increase the number of IT graduates in the workforce and for all school leavers and university graduates to have IT skills in order to function in employment. Students' experience of e-learning helps them to understand how IT affects the way society works.

Arguments for e-learning in higher education are, therefore, supported by both market- and policy-driven rationales. Our case is, however, that the principal reason for using e-learning in higher education is that it can enhance teaching and learning: that there is a strong pedagogic rationale for using e-learning. The force of this argument can be illustrated by reference to both graduate and undergraduate courses using e-learning at King's. In each of the departments in question e-learning grows out of a top-rated research

We have converted what was originally a lecture-based course on dental therapeutics into a mainly online Web-CT course. Webcasts and online tasks have created a dynamic learning environment.



PATRICIA REYNOLDS

environment, as well as out of a very lively 'conventional' teaching environment.

Undergraduate dentistry

A frequent difficulty for dental students is bridging the gap between the theory taught by listening to lectures, and the observation and practice with clinicians and real patients in the clinics. In the King's Dental Institute we have therefore developed a range of e-learning techniques such as presenting virtual patient scenarios which the students can explore before meeting real patients.

E-learning can be used, for example, to improve the accuracy of taking dental patients' histories. We have developed a digital method of recording students' questions through a bar-code questionnaire – the Student Activity System. This system lists all the patient conditions which the students have to determine and requires them to select the appropriate ones, thus ensuring that none can be missed out by mistake. This is transcribed using a sophisticated wireless-based touch screen system (Tablet PC) which allows an electronic patient record to be created. This technique enables the tutor to concentrate on the



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Students are able to work collaboratively: reviewing and discussing relevant research publications online to improve their understanding of different topics and practices.



JOE HARPER



PATRICIA REYNOLDS

history-taking process and practical work in the clinics. A central digital record of student activity is created which contributes to the quotas of required clinical work.

We have converted what was originally a lecture-based course on dental therapeutics (the clinical application and relevance of drugs and other therapies in dentistry) to a mainly online Web-CT course, with some key face-to-face topic lectures. Webcasts and online tasks have turned this course into a dynamic learning environment which includes interacting with up-to-date resources. The student support materials and activities include course notes, patient cases, guest lectures, students' own notes and a bibliography of relevant publications. Students are able to express their views and knowledge on a bulletin board and to work collaboratively: reviewing and discussing relevant research publications online in an evidence-based fashion to improve their understanding of different topics and practices. They can, of course, study topics at their own pace and in their own space, including when not at college. The teacher can also communicate with individual students online and contribute to these debates: something that would

be impossible on a traditional lecture course with 180 students.

We also use video-conferencing to give students access to a remote practising dental surgery in the Isle of Wight, to enable them to ask questions about ethics, dental diagnosis and practice, and to see into the patient's mouth more easily. Personal digital assistants are on trial, which enable students to keep records of their clinical work and their lectures and to access online dental resources. We are also developing a web-based prescription game, in collaboration with six other College departments. All of these projects have been facilitated by a succession of successful bids to the College Teaching Fund over 10 years.

Postgraduate dentistry

Postgraduate short courses for continuing professional development in dentistry are typically one-day events, with dentists having to travel to a regional centre. This limits availability to dentists even within the UK, and the Dental Institute has now developed a pilot scheme of blended courses, with background information delivered online, followed by a shorter, more efficient, face-to-face practical session. E-learning

has also brought in new groups of ‘customers’, attracting graduate students who want to combine study with work and personal activities, including those who are in remote parts of the UK as well as abroad. Access to coursework is provided 24 hours a day and seven days a week, and there are six times more students enrolled on the online master’s in *Clinical Dentistry (MclinDent)* than on courses delivered by traditional formats. Forty-eight per cent of our online students are based outside the UK. We are currently investigating the availability of e-learning in India and the impact of this programme in a country that is IT-rich but has no continuing professional development structure.

We have designed the *MclinDent* to take advantage of the many opportunities of e-learning while maintaining the quality of teaching and learning of our traditional, face-to-face teaching courses. By avoiding the lecture-style format, still seen on some teaching videos and broadcasts, we have overcome the out-of-date style that forces a complete overhaul after a few years. In contrast, *MclinDent* web pages can be easily updated in whole or in part and the e-learner can opt for the learning method that suits them best.

Clinical techniques are taught during intensive residential courses and examples of clinical work are submitted on videotape. Written assessments are submitted, marked and returned with embedded comments, through the online system. Examinations are taken in one of 600 examination centres around the world managed by the University of London, although online examination papers and script submission are under consideration.

The set-up and provision of such courses can be expensive, and cost recovery in the early years is difficult. We have approached this by offering scholarships to boost uptake of new programmes, as well as by providing continuing professional development and master’s classes in a blended approach using online materials. We have robust business plans, and our aim of breaking even after five years has been realised. Profits are reinvested in course development, new programmes and the revision of course material.

UNITED STATES DEPARTMENT OF DEFENCE/BRIAN L. WICKLIFFE



STEVE LEWIS. © MOD, FROM WWW.PHOTOS.MOD.UK



Postgraduate war studies

The Department of War Studies at King’s has, over several decades, been teaching mature students who have had to take time out of their busy lives to attend master’s courses on campus. Our new master’s in *War in the Modern World (WiMW)*, which started in September 2005, is designed to accommodate this kind of student. The course aligns well with the College’s policy of increasing postgraduate, international and part-time students, and we were able to secure funding to develop it from the UK E-University (before its demise).

The challenge for *WiMW* was to create a completely new programme delivered in an entirely new manner, taking into consideration the research and practice of e-learning pedagogy, and at the same time to deliver the same quality and level of postgraduate provision as all other degrees from the Department. We decided that *WiMW* would not assess the students through examinations (unlike the rest of War Studies) but through essays and other writing activities, and that it would not have any residential requirement.

Students have access to a very content-rich programme, including multimedia materials such

The screenshot shows a web browser window with a course page titled "The origins of containment". The page features a red header with the title and a portrait of George Kennan. The main content area contains text about the origins of containment during the course of 1946, mentioning the Truman administration's policy of containment and the Soviet government's initial refusal to withdraw its troops from Iran. A small image of George Kennan is also visible on the right side of the page.

Students have access to a very content-rich programme, including multimedia materials and weblinks to the substantial digital resources of King's library.

The challenge for *War in the Modern World* was to create a completely new programme delivered in an entirely new manner of the same quality as the Department's other degrees.



UNITED STATES DEPARTMENT OF DEFENCE / LESTER COLLEY

as video, audio and maps. Many readings and documents are provided as pdfs or web links either to outside sites or directly into the substantial digital resources of King's library.

Staff follow best practice in e-learning pedagogy by involving the students in their own learning. Tutors use exercises and activities that reinforce and extend students' knowledge, and formative assessment which monitors students' learning on a continuous basis and modifies the teaching accordingly. Tutors communicate regularly with their students via the virtual learning environment (VLE), in discussions, by email, by internet telephony, occasionally by telephone and sometimes in person. Completed assignments can be uploaded directly into the VLE, enabling the tutor to access them at any time and to provide marks and comments.

Educational research has also shown that the most compelling reason for developing e-learning in higher education is the positive impact it can have on teaching and learning. This includes changing the ways in which knowledge is represented, the method of course delivery and the ways in which students work alone and together. These changes require an analysis of

the skills required of teachers and learners, so that they can be trained to use these in e-learning environments. For more than 40 years e-learning has been growing in all education sectors.

Where it has been driven by markets or policies it has often resulted in superficial uses of what is potentially the most revolutionary innovation in teaching and learning. If universities are to learn from the lessons of previous experience, then their use of e-learning must – as in the King's examples described above – be academically-driven.

● This article is abridged from 'Academically-driven e-learning in higher education' (forthcoming, Computers and Education) by Richard Trainor, Margaret Cox, Brian Miller, Anne-Lucie Norton and Patricia Reynolds. It draws on a presentation given by the Principal to the Higher Education Policy Institute in 2005. Pat Reynolds was a finalist in the 'Imaginative Use of Distance Learning' in the Times Higher Educational Supplement awards in November 2005, and David Betz of the War in the Modern World programme was runner-up in the E-Tutor of the Year award, 2006.

STUDENT DIARY 2005-6

As President of KCLSU in 2005-6 I've had the privilege of being party to a year of great student achievement. The belief that any student can make a difference to their university was the reason I stood for election in the first place, and today I believe that more than ever. However, that difference is much further-reaching when students build partnerships with other students and with their institution. Dedication to an organisation, or a cause, means being willing to recognise the talents of those around you, and to foster the development of the community as a whole. This year has demonstrated the power of partnership in working towards both collective and individual aims.

Personally, my year has been a never-ending round of meetings, presentations, lunches and dinners. I've met the Minister for Higher Education, the Archbishop of Canterbury, the US Ambassador and The Princess Royal – not quite the usual suspects for your average student activist!

In this respect I suppose I've been the visible face of KCLSU, and have been offered the opportunity to engage with those people so important to the future of students at King's. It's in this way that my fellow officers and I have been able to fulfil our pledge to the students. We have constantly badgered those in the College and elsewhere who have the power to bring about change. This has resulted in increased physical access at two of the main sites; a contribution to the refurbishment of the Waterfront bar at the Strand Campus; a re-examining of the student feedback process; a dedication to more student social space in the coming years; a continuation of our volunteering programme; and the most ambitious students' union governance development in the country.

However, without the knowledge that we've had a superb team behind us at all times, our confidence would have waned. And without the never-ending examples of student achievements, dedication, and their constant drive to do better, I would have had little to pass on but the colourful opinions of a geography student.

Fairtrade

This year it was the students who drove forward King's application for Fairtrade status. Without the hard work of the People and Planet Society, who made it their aim to demonstrate student support for such an ambitious project, King's College London would not have brought London that much closer to achieving Fairtrade City status. KCLSU may ensure that paperwork is completed and meeting rooms are booked, but the spirit of the things we do is, as it should be, firmly in the hands of students. It is they

who make or break the deal – and invariably make it possible for us to sign on the dotted line.



Global union

The 'Multicultural Mela', an ecstatic celebration of diversity, has paved the way for how we support campaigning and events in the future. Gone are the days when KCLSU would simply try to convince students of the importance of this or that issue, working on it internally. The Mela was a one-off spectacular event held in order not only to bring together all faiths at King's but also to raise money for the victims and families of the Tsunami; with stalls ranging from traditional Sri Lankan food, to a second-hand clothes stall,

Matt Pusey, President of King's College London Students' Union (KCLSU), reports on a year of achievements from Multicultural Mela to Gilbert and Sullivan, and from volunteering to Investors in People.

to traditional jewellery from many different cultures. There were also performances of traditional dance and music performed by various KCLSU clubs and societies. The Mela was conceptualised, organised and run by a small group of highly talented students who are passionate about community, and passionate about King's.

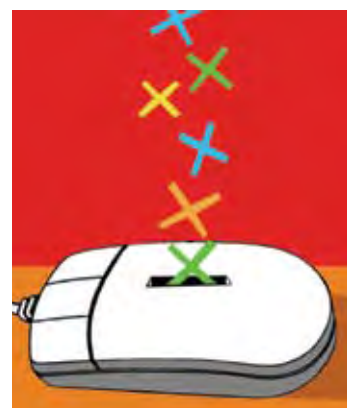


StopAIDS

It's the same with the medical schools. For years they have been a hub of extra-curricular activity: the irony being that those with the least free time are among the most willing to donate it for others' benefit. The StopAIDS group raised almost £2,000 in a single day. All KCLSU had to do was let them know they had our full support and the use of our resources. This year's RAG again raised over £100,000. These events not only gather much needed financial support, but also make an immeasurable contribution to building our community.

Volunteers

Medics have also been instrumental in helping us to develop our student-led volunteering programme. Once again it is they who brought the ideas and KCLSU that ensured the framework was in place for them to maximise their potential. Today we have a plethora of projects doing great work in this country and abroad. 'KCLSTAR' is active in supporting refugees, 'Do the Smart Thing' encourages young people from under-privileged backgrounds to enter higher education, 'Sexpression' teaches sexual health in schools, 'Project Kenya' literally builds communities, 'Tenteleni' delivers HIV/AIDS awareness education in sub-Saharan Africa and 'SHINE' provides mentors for UK children of primary school age. This list alone makes me infinitely proud to be a member of this community.



Elections

KCLSU itself has also achieved much in 2005-6. We ran our first online election – with great success – achieved Investors in People status, recruited a Chief Executive, and laid the groundwork for an entirely new system of governance.

Showtime

Clubs and societies have again made huge contributions to our community. These include the Guy's, King's and St Thomas' Christmas Show, 'Singing in the Rain'; the Diwali Show, 'An Asian Story' from the Malaysian and Singaporean society; the Dance Show, 'Soul Sikher'; 'Ruddigore' by the Gilbert and Sullivan Society; success in Beijing for the Model United Nations Society and yet another step up the British Universities Sports Association (BUSA) rankings.

A



POINT

Students in King's top-scoring School of Law achieved notable successes in international moot competitions in 2006. A moot (from the Old English *gemot*, a meeting) is a mock trial, where participants argue points of law as they would in a court. Also on display are their skills as public speakers and their ability to engage in spontaneous legal argument.



ILLUSTRATIONS: JOHN HOLDER

The Republic of Acastus and the State of Rubria are in dispute about a projected oil pipeline which threatens to destroy the agricultural lands of the Elysian Fields. The case is to be heard before the International Court of Justice, and top lawyers for each side must marshal the facts, argue the issues and convince the court of their side of the case. This was the scenario facing some of the King's law students who scored notable successes in international mooting competitions this year. Arguing the case for the (fictional) Elysians earned the College's undergraduate team first place in February in the 2005-6 UK national rounds of the prestigious Jessup International Law Mooting Competition. This is the world's largest moot, attracting more than 1,500 students from 86 countries. The team then represented the UK in the Jessup international final in Washington in April, and came in the top 12 out of over 560 teams in the part of the competition involving memorials (written submissions).

A moot (the word comes from the Old English *gemot*, a meeting) is a mock trial, where participants argue points of law as they would in a court. 'Student advocates are given a fictitious case which raises contentious points of law', explains Law Professor Eva Lomnicka. 'They present the legal arguments that best support their side of the case to a panel representing the court, with the judges intervening

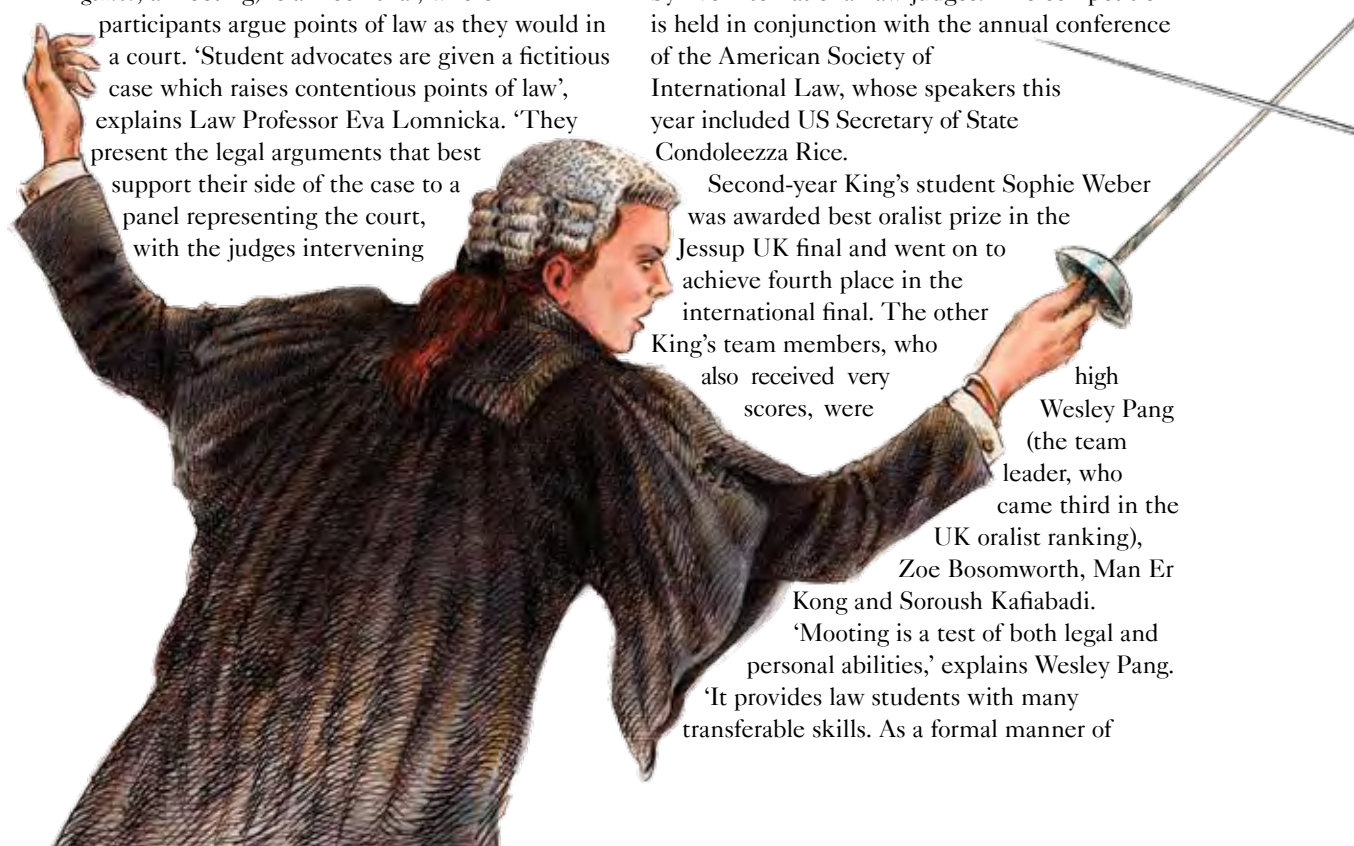
to seek clarification of the arguments. Some moots also require and assess the contestants on a written 'memorial', which is a lengthy document requiring a thorough knowledge of the points of law involved, backed by effective legal research and the ability to develop a legal argument. Marks are awarded for knowledge of law and its application to the facts; proper and articulate analysis; extent and use of research; clarity and organisation; correct format and citation, as well as grammar and style.'

Oralists

Students can also win as individual 'oralists', who are judged on their skill as public speakers and their ability to engage in spontaneous legal argument, with marks awarded for knowledge of law; application of law to the facts; ingenuity and ability to answer questions; style, poise, courtesy and demeanour, and time management and organisation. The Jessup International Law Mooting Competition is organised by the International Law Students Association, and its final is presided over by five international law judges. The competition is held in conjunction with the annual conference of the American Society of International Law, whose speakers this year included US Secretary of State Condoleezza Rice.

Second-year King's student Sophie Weber was awarded best oralist prize in the Jessup UK final and went on to achieve fourth place in the international final. The other King's team members, who also received very high scores, were Wesley Pang (the team leader, who came third in the UK oralist ranking), Zoe Bosomworth, Man Er Kong and Soroush Kafiabadi.

'Mooting is a test of both legal and personal abilities,' explains Wesley Pang. 'It provides law students with many transferable skills. As a formal manner of



Mooting is a test of both legal and personal abilities. It provides Law students with many transferable skills and is excellent preparation for any form of negotiation or mediation.

advocating your views before a group of people, it's excellent preparation for any form of negotiation or mediation. It also involves a high degree of understanding of your position in order to cogently present an argument. As a team we also learned that it's not only about how you personally cope but also how to help others with the anxiety. In addition, the competition fostered cultural exchange between law students from different legal systems and perspectives.'

Passionate

'I love public speaking and presenting my case and argument before others,' says Sophie Weber. 'The Lord Justices, professors and academics discuss things with you on an equal level and very often, after a thorough preparation, the mooter has a deeper knowledge than they have and so sometimes you really can impress them! I get passionate about finding the ideal argument, the really good point to which there is no counter-argument. It's a lot of fun to work together with others for a long time on a project, and you become really good and close friends.'

'Mooting is as close as you can come to real life in court. It allows you to connect material studied on a theoretical basis to a real problem. It enables students to start training at an early stage in their career: not only for barristers but also for solicitors. Finally, mooting and being

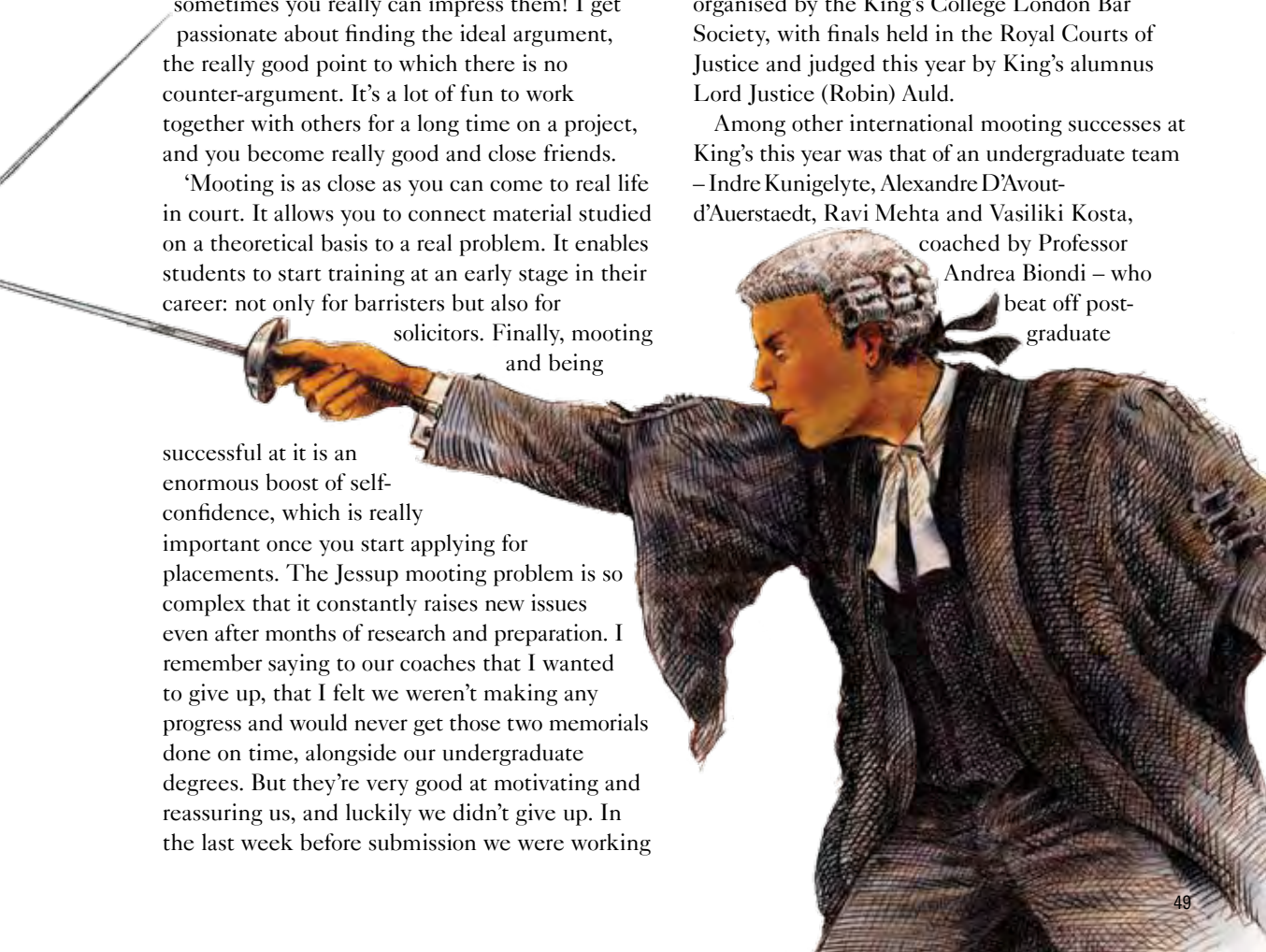
successful at it is an enormous boost of self-confidence, which is really important once you start applying for placements. The Jessup mooting problem is so complex that it constantly raises new issues even after months of research and preparation. I remember saying to our coaches that I wanted to give up, that I felt we weren't making any progress and would never get those two memorials done on time, alongside our undergraduate degrees. But they're very good at motivating and reassuring us, and luckily we didn't give up. In the last week before submission we were working

18 hours a day, barely eating or sleeping. We submitted just on time, with five seconds remaining!'

'The team thoroughly deserved their success, which was achieved with dedication, professionalism, courtesy and good humour', comments Dr Jamie Edelman, the team's coach. 'It's testament to their personalities that the team never once complained but pulled together and worked together and supported each other throughout.'

Although not a compulsory part of the Law curriculum, mooting is strongly encouraged in the King's Law School and is a very popular extra-curricula activity. There are two College-based mooting competitions: one organised by the School and sponsored by the international law firm Baker and Mackenzie, which was judged this year by Law Lord, Lord Rodgers, and the other organised by the King's College London Bar Society, with finals held in the Royal Courts of Justice and judged this year by King's alumnus Lord Justice (Robin) Auld.

Among other international mooting successes at King's this year was that of an undergraduate team – Indre Kunigelyte, Alexandre D'Avout-d'Auerstaedt, Ravi Mehta and Vasiliki Kosta, coached by Professor Andrea Biondi – who beat off post-graduate



KING'S LAW TOPS NATIONAL SURVEY

King's Law School was voted the top UK university law department for student satisfaction in the second National Student Survey in 2006.

Commenting on the School's success, Robert Blackburn, Acting Head of Law, said: 'Students are at the heart of what we do. We have a high level of pastoral care; we see our tutees regularly and we enjoy their company. King's is in the heart of the legal world, with the Royal Courts of Justice, the Inns of Court and many barristers' chambers close by, and we put teaching in the context of the real world. We are also leading the way in providing teaching resources for students, with a high level of IT support and three dedicated members of staff.'

competition in the European Law Moot Court to reach the regional semi-final, held in Boston, USA, in February: making them one of the world's top 16 teams. Their 'Advocate-General' (played by Vasiliki Kosta) also reached the final.

On the postgraduate side, LLM students Steven Katevatis, Hamed Fathinejad and Emmanuel Saurat won the national round of the prestigious World Trade Law International Moot Court Competition, with Hamed Fathinejad also scooping the best oralist of the day award.

'Mooting is particularly exciting,' Hamed comments. 'As a participant you're required to articulate arguments, responses and defences without any prior preparation and to think laterally. Entering the room with the task of negotiating with another delegation from a different State sends an exciting adrenaline rush down your spine. The grilling session of "interrogation" by the judges, when coupled with the joy of success, is particularly stimulating.'

'As one of our judges put it, a successful team is one that possesses and exhibits the solicitor-barrister co-operation within the court-room.'

Below left and right: A law seminar with Ben Bowling, Professor of Criminology & Criminal Justice.



Observing, responding and improvising to the reaction of the judges are crucial skills. What makes the WTO moot court competition particularly distinctive and exciting is that all the parties are unaware of the teams' arguments, and thus are forced to formulate responses accordingly.'

This team also achieved the highest mark in Europe for their written submissions, thanks to the coaching of Stephanie Motz (who won the best oralist prize when she competed as a King's LLM student in the WTO moot four years ago and is now a part-time lecturer at King's) and Professor Piet Eeckhout, Director of the Centre of European Law. Success in the regional round in Lithuania ensured their place in the finals in Geneva where they argued on behalf of the UK. The team then took third place in the world, and Hamed Fathinejad was awarded best oralist in the preliminary rounds. 'The team displayed exceptional commitment', says Stephanie Motz. 'They undertook extensive research, becoming specialists on the relevant cases in WTO agriculture, and achieved the highest standards of mooting.'



Top: LLM students Steven Katevatis (bottom right), Hamed Fathinejad (second left) and Emmanuel Saurat (top centre) celebrate their success in the national round of the World Trade Law International Moot Court Competition with their coach Stephanie Motz and friends.

Above: The winning King's team of the UK national rounds of the Jessup Mooting Competition. From left: Man Er Kong, Sophie Weber, Zoe Bosomworth, Her Excellency Justice Rosalyn Higgins of the International Court of Justice, Wesley Pang and Soroush Kafabadi.



CONOR MASTERS/SON

From the Author

R. G. Whitfield

L. F. Blackett

W. E. Bacon, Esq.

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WHAT IT IS, AND WHAT IT IS NOT.

NOTES ON HOSPITALS.

From the Author
from the Author
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From Mrs P. Birch

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 DISCOURSE
 ON THE
PLAGUE:

BY

RICHARD MEAD,

Fellow of the College of Physicians,
 and of the Royal Society; and
 Physician to his MAJESTY.

THE NINTH EDITION corrected and enlarged.

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**APPLYING
 INTELLECT TO INFECTION**
 Past and present contributions to the fight against infection.

The fight against infection – from plague to MRSA – is featured in new book which celebrates the contributions to biomedicine made by people in the institutions which now form King’s College London. This story is also reflected in the historic publications acquired by their libraries over the years: now one of the largest collections of historical medical books and journals in any UK university library.

Infectious disease has always been a major cause of death, and the area of South London served by the Guy’s, King’s College and St Thomas’ hospitals suffers from some of the highest rates of infectious disease in the country. Research at King’s College today recognises two of the newest challenges posed by the ever-changing face of infection – human immunodeficiency virus (HIV) and methicillin resistant staphylococcus (MRSA).

Richard Mead

For centuries, diseases with a high mortality such as plague, smallpox, syphilis and tuberculosis were made more terrifying by the mystery surrounding how they were transmitted. The scientific approach adopted by St Thomas’ physician Richard Mead (1673-1754) stands out from a history of quack remedies, astrological theories

and charms against infection. His *Short Discourse Concerning Pestilential Contagion and Methods to be Used to Prevent It* (also known as *Discourse on the Plague*) was commissioned by the government in response to a new outbreak of plague in 1720.

People at this time still remembered how the plague of 1665 had killed 6,000 people in a week. Mead advised that the sick should be separated from the healthy, rather than the previous practice of quarantining whole households. He also pointed out that fabrics could transmit plague (although the role of fleas was not yet known): an early contribution to the theory of contagion.

A 1744 edition of this ground-breaking work, with Mead’s inscription, is in the King’s Foyle Special Collections Library at Chancery Lane. The College has over 20,000 medical books and journals printed before 1901 which were acquired by the libraries of St. Thomas’, Guy’s and the former King’s College School of Medicine and Dentistry to support teaching and research.

In 1721 Mead turned his attention to smallpox, which during the seventeenth and eighteenth centuries supplanted bubonic plague as a major epidemic killer. With his friend Sir Hans Sloane (1660-1753), Mead conducted trials of smallpox inoculation among condemned prisoners in Newgate Prison. Undertaken with the full consent of the King and lawyers, the intention



Left: A cowpox lesion from Edward Jenner’s *An Inquiry into the Causes and Effects of the Variolae Vaccinae*, a disease discovered in some of the western counties of England, particularly Gloucestershire, which was published in 1798.

Right: During an outbreak of plague in 1720 the St Thomas’ physician Richard Mead advised the government that the sick should be separated from the healthy and pointed out that fabrics could transmit the disease.



An eighteenth-century depiction of the great plague of London in 1665 which killed more than 6,000 people a week.



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was benign, even if these trials do, to modern ears, carry worrying overtones of medical experimentation. The experiment was successful, partly because it avoided the two pitfalls of inoculation: the entire community of patients was quarantined and the programme of inoculation was complete, not partial.

Jenner, Cline and Birch

Edward Jenner (1749-1823) discovered that cowpox was an effective prophylactic against smallpox, but lacked contacts in London medical circles. However, a well-known surgeon at St Thomas', Henry Cline (1750-1827), took up Jenner's cause by carrying out successful vaccinations with cowpox in the capital. A collection of pro-vaccination tracts by Jenner and his associates, with an inscription which

records their gift to Cline, is included in the St Thomas' Historical Collection, as are two tracts by the leading opponent of vaccination, the St Thomas' surgeon John Birch (1745-1815), with an inscription by his sister.

Birch believed that the older method of inoculation was more effective, and that vaccination with cowpox often led to side-effects. He analysed the gravest flaw in Jenner's arguments: that he had not elucidated the relationship between cowpox and smallpox. Birch also put forward the Malthusian argument that smallpox 'was a merciful provision on the part of providence to lessen the burden of a poor man's family'. No doubt Birch would have preferred to be remembered for his advocacy of the use of electricity as an alternative surgery, involving



Sir John Simon of King's College Hospital was the first Medical Officer of Health for London. One of his great achievements was making smallpox vaccination compulsory for all children in 1870.



Lord Lister was Professor of Surgery at King's College from 1877 to 1893. His use of carbolic spray (right and below) to provide an antiseptic environment during surgery drastically reduced infection and revolutionised surgical practice.

the transmission of shocks from a Leyden jar to patients seated in an insulated chair.

John Simon

Improvements prompted by Florence Nightingale and others in hospital practice and conditions helped to bring about public health reforms such as the 1866 Sanitary Act, which enforced the connection of all new houses to a sewer and defined overcrowding as a nuisance, and the Public Health Act of 1875. Both acts were influenced by Sir John Simon (1816-1904), who was surgeon at King's College Hospital before becoming the first Medical Officer of Health for London. One of Simon's great achievements was making smallpox vaccination compulsory for children in 1870. A copy of Simon's *Reports Relating to the Sanitary Condition of the City of London* (London, 1854), with an inscription by the author, is included in the St Thomas' Historical Collection.

Lord Lister

Until the early twentieth century, all surgical procedures carried a high risk of death. Limbs injured by compound fracture were usually amputated because of the fear of gangrene, although half the cases died nevertheless. Abdominal surgery carried such a high risk of mortality that, apart from ovariectomy, it was banned at King's College Hospital. It was thought that surgery on the chest, abdomen and brain would never be possible.

The practice of antiseptic surgery developed by Joseph Lister (1827-1912), who was Professor of Surgery at King's from 1877 to 1893, completely changed this situation. In 1860, while he was Professor of Surgery at Glasgow Infirmary, Lister began to investigate the implications of Louis Pasteur's germ theory. Convinced that putrefaction was caused by airborne bacteria, Lister used carbolic acid-soaked bandages on wounds to create a barrier against infection. In 1867 he reported in the *Lancet* that of 11 cases of compound fracture he had treated, nine had recovered – an excellent result for the time.

Lister's apparatus for spraying carbolic acid over an operation site.



Lister's principle – that bacteria must never gain entry to an operation wound – remains a basic principle of surgery to this day.



After he came to King's, Lister continued to develop antiseptics in the College's hospital. He made surgeons wash their hands and instruments in carbolic acid before and after operations, wear clean gloves and swab incisions with carbolic, and he introduced carbolic sprays into the operating theatre. There was great resistance to these changes from a profession which had worn blood-soaked frock-coats as a mark of honour, as well as objections to the harsh effects of the carbolic acid which left surgeons with cracked skin.

Lister's theory and practices did, however, gradually gain support from surgeons, and from the mid-1880s there was a rapid increase in the use of his antiseptic techniques. This made possible more advanced life-saving surgery, including brain and abdominal surgery (Lister was the second man in England to operate on a brain tumour). By 1910 post-operative mortality for major operations had reduced from 40 per cent to less

than three per cent, and Lister's principle – that bacteria must never gain entry to an operation wound – remains a basic principle of surgery to this day.

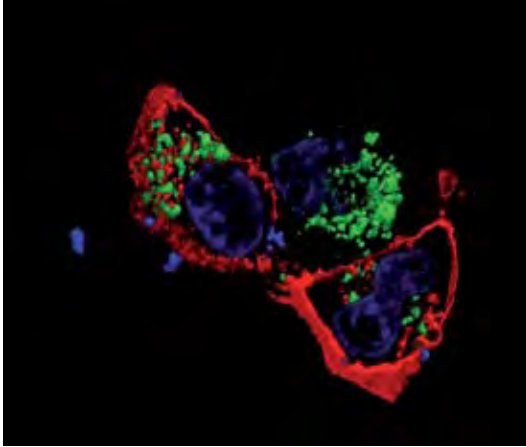
HIV research

One of the most important areas in which King's continues its legacy of research into infectious diseases is in understanding and finding treatments for HIV, now one of the world's most devastating infectious diseases. The College's local area of South London has the highest rate of HIV in the UK. Understanding the molecular events affecting HIV host interactions leading to the basic event in HIV infection – the invasion of T-cells by the virus – is crucial for the development of effective drugs and vaccines.

A key insight, relevant to other virus infections as well as HIV, came with the description by King's researchers in 2003 of a previously unknown

HIV virus. A digital reconstruction of infected cells with virus antigen shown in red, endosomes shown in green and the cell nuclei in blue.

DEPARTMENT OF INFECTIOUS DISEASES



mechanism in human cells to protect against viral infection. HIV produces a protein, Vif, which is essential for the virus to enter cells and replicate. How Vif did this was unknown until the discovery of a gene, CEM15, which produces a protein which renders HIV non-infectious. Vif counteracts this beneficial gene and its product. This significant finding could lead to new treatments for HIV: by blocking the action of Vif, CEM15 would be allowed to work properly and prevent HIV replicating and spreading. Research is ongoing to identify substances that bind to and inhibit Vif in the cell, and to define its structure and precise modes of action.

Non-progressive HIV

As HIV-infected populations are monitored, it has become clear that there are groups of patients who do not progress from HIV to AIDS. A 12-year study of these 'non-progressors' by King's researchers with collaborators in other centres has defined several novel immunological features which help to protect the patient from the full-blown disease. The subtypes of HIV also influence the disease, and an epidemiological study of these and their effect on progression and response to treatment is ongoing in South London.

Drug therapy for HIV

King's is also collaborating in two large UK-based studies analysing factors affecting patients' responses to treatment for HIV. Among those

described are the rate of viral rebound after reduction in HIV load related to the antiviral drugs used, and the long-term probability of detecting HIV-1 resistance. The clinical trials programme at King's College and St Thomas' hospitals is evaluating novel antiviral agents. Black Africans and Caribbeans are diagnosed significantly later than the general population, and an MRC-funded study at 10 UK centres including King's is examining the socio-demographic, behavioural and laboratory factors affecting the impact of HIV and its treatment on this section of the population.

Vaccines

The ultimate aim of ridding the world of HIV is through the production of an effective vaccine. Work to date has shown that DNA HIV vaccines are safe and well tolerated. An alloimmune HIV vaccine is undergoing evaluation. Vaccination by the mucosal route, mimicking the natural method of infection and involving the regional lymph nodes, is being evaluated.

MRSA – in the footsteps of Lister

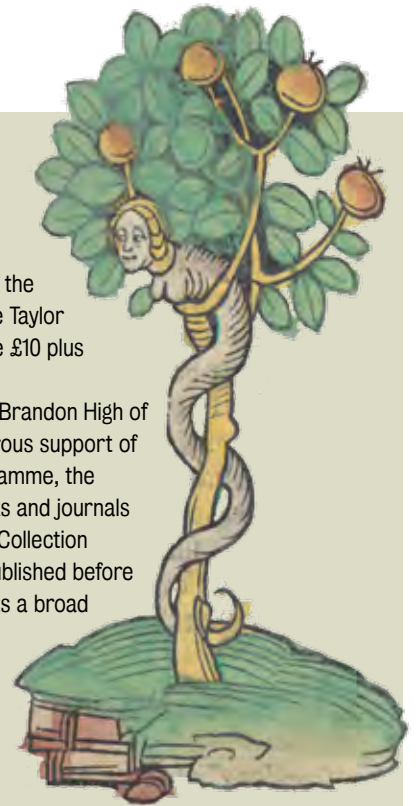
Methicillin resistant staphylococcus aureus (MRSA) has become a household name as a hospital-acquired, sometimes fatal, infectious disease. In 2003, nearly 1,000 UK patients died from this infection, and the reported incidence of infection is 7,000 annually. Its descriptive name underlines its challenge: it is resistant to the range of antibiotics used to treat staphylococcal infections. Patients infected with MRSA experience what is in effect a return to the pre-antibiotic era.

Work at Guy's and St Thomas' hospitals is using molecular analysis of MRSA in a number of ways to reduce its impact. Researchers have shown that the contaminated hospital environment is a source of cross-infection, as MRSA can survive on dry surfaces for many weeks. Conventional cleaning fails to decontaminate these surfaces but gassing with H₂O₂ (hydrogen peroxide) is effective. From 2004, highly virulent community strains of MRSA with a predilection for children have developed, and studies of the molecular epidemiology and control of these organisms have begun.

CONTRIBUTIONS TO BIOMEDICINE

This article is based on a feature in *Contributions to Biomedicine: A continuing story*, an illustrated history celebrating the pioneering contributions of the staff past and present of King's College London and of the Guy's, King's College, St Thomas' and Maudsley hospitals. Written by Claire Taylor and Gwyn Williams, it was published in April. Copies can be obtained, price £10 plus post and packing, by contacting claire.taylor@kcl.ac.uk.

This article also incorporates material supplied by Katie Sambrook and Brandon High of the Foyle Special Collections Library at King's. In 2005, thanks to the generous support of the Wellcome Trust's Research resources in medical history funding programme, the Library began a two-year project to increase scholarly access to the books and journals from the St Thomas' Historical Collection by cataloguing them online. This Collection comprises some 4,000 printed books and 2,000 volumes of journals, all published before the twentieth century. There are outstanding holdings in anatomy, as well as a broad collection of material in other areas of medicine and science. The oldest volumes in the Collection are a fine copy, with hand-coloured woodcuts throughout, of the scientific encyclopaedia *Hortus Sanitatis* (printed in Mainz, 1491) and an equally well-preserved copy of John of Gaddesden's *Rosa Anglica* (Pavia, 1492), thought to be the first medical printed book by an English author.



Above: 'The Tree of Life', from the first edition of *Hortus Sanitatis* printed in Mainz in 1491: one of the oldest books in the Foyle Special Collections Library at King's. Right: A maiden and unicorn, from the *Hortus Sanitatis*.

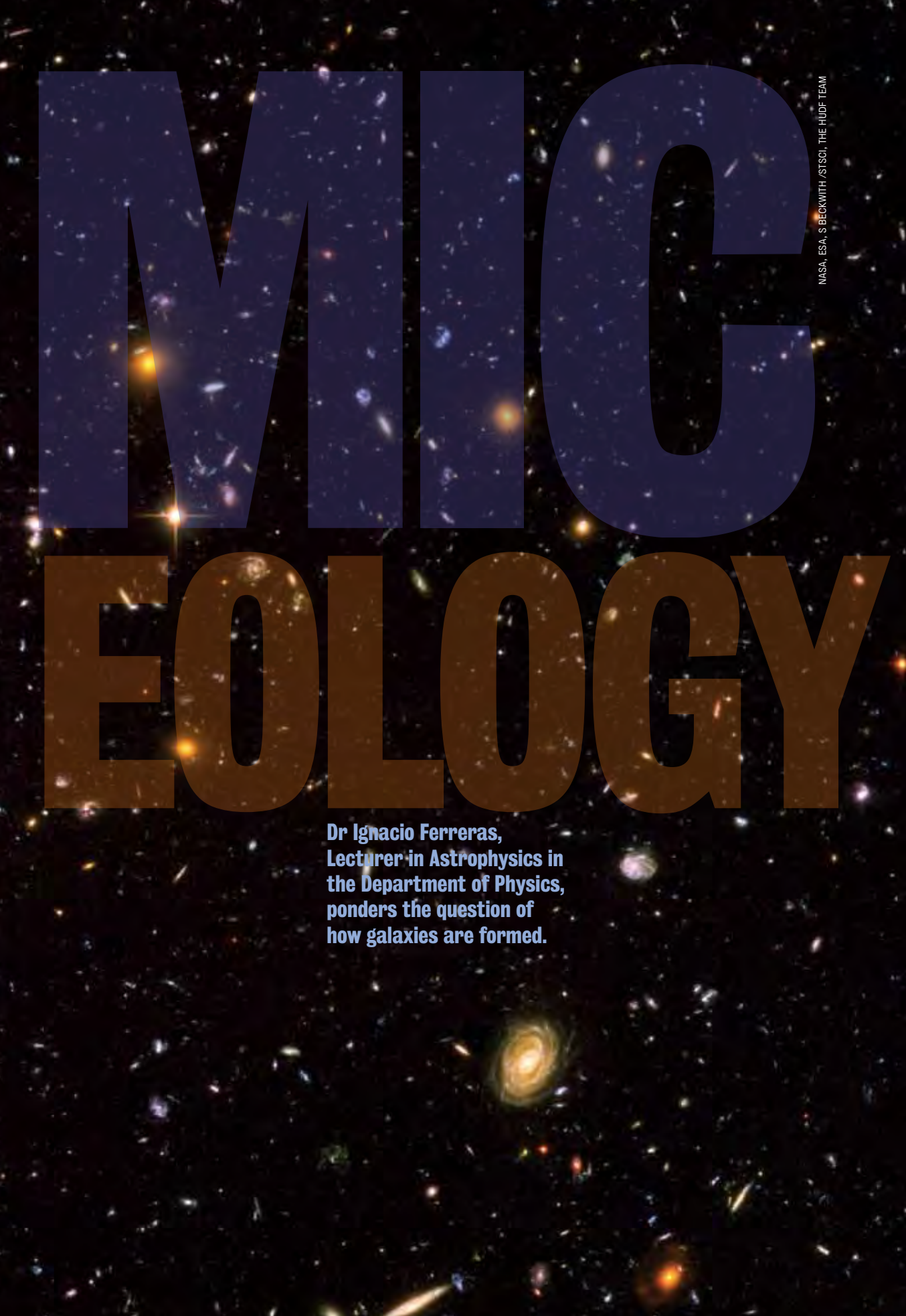
BioBank

In 2005, King's announced plans for the world's first infectious diseases biobank, to be housed at Guy's Hospital. This library of clinical materials, containing DNA and RNA samples and live frozen white blood cells, will support King's research into HIV, MRSA, hepatitis B and malaria. King's location in South London is ideal for studying agents of infection, both local and international, as the catchment area from which the BioBank will draw its samples is ethnically diverse, mobile and impoverished – factors which allow infectious diseases to flourish and new agents to emerge.



COGS ARCHA

The Hubble Ultra Deep Field.
An image taken by a ground-based telescope would find this a blank region of the sky. However, when the Hubble Space Telescope exposed its Advanced Camera for Surveys for over 11 days a swarm of galaxies appeared. The colours give valuable information about both their distance and their formation process.



WMFC

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EOLOGY

**Dr Ignacio Ferreras,
Lecturer in Astrophysics in
the Department of Physics,
ponders the question of
how galaxies are formed.**

Encounter and merging of two galaxies. The larger image shows two disrupted progenitors 'dancing' around each other, leaving behind a trail of dust (dark red patches) and young stars formed by the interaction (blue clumps). A few billion years later, this system will look like an inconspicuous elliptical galaxy as shown in the smaller image (below). Galactic archaeology focuses on extracting the past history of a galaxy from observable clues left behind.



BRAD WHITMORE/STSCI & NASA

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Galaxies are the building blocks of the Universe. Like our own home galaxy – the Milky Way – galaxies are island universes mostly made up of gas (hydrogen and helium), dust and billions of stars. Understanding the formation and evolution of galaxies is one of the key questions of modern science.

Before the 1920s, it was not clear to astronomers what galaxies were. Through the telescope they looked like blurry smudges of light, comparable to other nebulous objects such as the Orion nebula, which is a cloud of gas within our own galaxy. It was the giant strides of astronomers such as Edwin Hubble and Allan Sandage that put galaxies in their proper perspective: showing them to be island universes as big as our own galaxy, living in a huge, ever expanding universe. In recent decades, developments in optics and solid-state physics have given us instrumentation capable of detecting galaxies so far away that the light we receive from them corresponds to an epoch when the Universe was just one tenth of its current age. The image on page 60 shows a

picture of the deepest image of the sky: the Hubble Ultra Deep Field. There are ongoing as well as projected surveys that will gather a vast amount of information from millions of galaxies. Extragalactic astrophysics has flourished as a science at the frontier of our knowledge, bridging the gap between the very large and the very small. We now study the large-scale distribution of galaxies to find out about the properties of particles and fundamental physics.

Stars and galaxy formation

Because of the vast distances that separate galaxies, light is the only information we can gather from them. In order to study their formation process we use our knowledge of the theory of stellar evolution to determine the age of a stellar population by observing its spectral energy distribution (ie the distribution of light with respect to wavelength, or roughly speaking, its 'colours'). A recent burst of star formation generates stars over a wide range of masses: from very massive stars – 10 times that of the Sun – down to the smallest stars that can burn hydrogen to stay active – with masses around one tenth of

The dark side of galaxies. A large fraction of the matter in a galaxy is in a component we cannot see directly with telescopes. We have to use indirect techniques to determine how much there is of this dark matter. The two figures above right show how gravitational lensing can be used for this purpose. Light from a far away background bright source is bent by the gravitational pull of the galaxy (the extended central source in the Hubble Space Telescope infrared images). This light-bending effect is similar to what a lens does. In this case multiple images of the background source are generated (the circular white dots). We can use these images to 'weigh' galaxies. The graphs below show that two galaxies with a similar content of stars and luminous matter have a very different contribution from dark matter.

Figure A

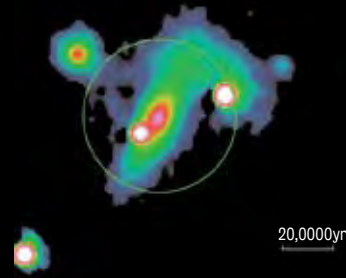


Figure B

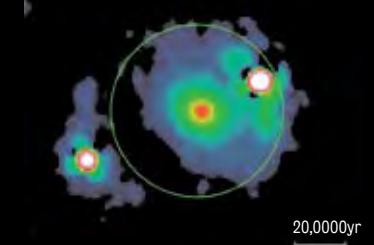


Figure C

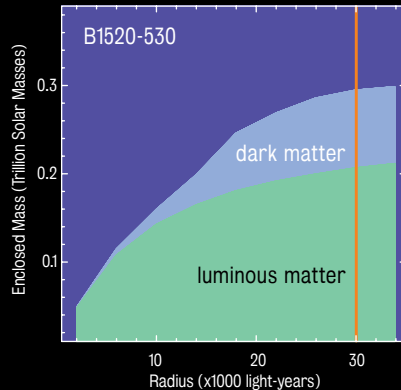
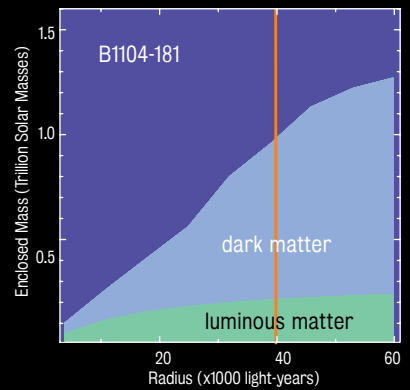


Figure D



the solar mass. The lifetimes of stars depend strongly on their mass. The very massive ones burn their fuel very quickly and die in a few million years, a much shorter interval than the life of a star like the Sun, which can live for 10 billion years. After a recent episode of star formation the light from a galaxy is dominated by the very massive stars. These stars have very hot atmospheres, appearing blue. A few million years later, these massive stars die, leaving behind the longer-lived lower mass stars which are cooler and therefore redder. Hence, we expect red and blue galaxies to represent old and young stellar populations respectively.

Galactic archaeology

Finding out the formation process of a galaxy from the light we receive from its stellar populations is the goal of galactic archaeology. For nearby systems – like our own Milky Way and its galaxy satellites such as the Magellanic clouds – we can observe individual stars. By performing an analysis of these stars with respect to their age, velocity, and position in the galaxy, we can decipher the formation process. Distant galaxies

are more complicated to study because the light we receive from them comes from unresolved stellar populations comprising millions, if not billions of stars. It's as if we tried to determine the history of London by observing a blurred image combining all its historical landmarks as well as modern buildings. Analogously to the invasions, revolutions and quiescent periods that shaped the present structure of London, one can also explore the episodes of formation of a galaxy that led to their actual spectral energy distribution. Of course one could not make an accurate estimate of the formation history of a single galaxy (or a single city). However, it is when we work with large samples that we can statistically determine the way galaxies form.

Recent projects such as the Sloan Digital Sky Survey (SDSS) have allowed such a study of galaxy formation. SDSS uses a dedicated, 2.5-meter telescope at Apache Point, New Mexico, to perform both photometry and spectroscopy of galaxies. In the first phase – recently finished – SDSS has mapped about 8,000 square degrees and obtained spectra from nearly 700,000 galaxies.

Late type



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Early type



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A tale of two galaxies. Even though galaxies come in many possible morphologies or forms, they can be generally classified into two general types. Late-type galaxies (above left) are blue galaxies with a significant ongoing process of star formation. In contrast, the light from early-type galaxies (below left) is dominated by old stars. Our goal at King's is to extract star formation histories such as those sketched in figure E from the spectroscopic data we can collect from telescopes shown in figure F. The shaded areas in figure F show characteristic spectral regions which are most sensitive to the ages of stars.

Another way to perform galactic archaeology is looking into the past. The light we detect from very distant galaxies corresponds to an epoch when the Universe was a fraction of its current age. SDSS is a wide-area survey but it cannot probe deep enough to look for distant galaxies. There are other surveys which follow a different approach, targeting smaller regions of the sky at a much deeper level. These so-called pencil-beam surveys, such as the Great Observatories Origins Deep Survey (GOODS), make use of NASA's Hubble Space Telescope in order to be able to resolve the shapes of distant galaxies. These galaxies represent the early stages of those seen by SDSS. Light from some of the distant GOODS galaxies left their 'home' when the Universe was just one tenth of its current age.

Formation

At King's we are currently working on subsamples both from SDSS and GOODS in order to explore the star formation history of galaxies. Our findings suggest that galaxies form their stars in two different models: a quiescent mode (like the current status of our Milky Way)

and a runaway bursting mode, which is the way massive giant ellipticals were formed. The emergent picture is that of a Universe in which by the present time most of the stars in galaxies have been already formed. We live in an epoch in which only the cosmic leftovers are being transformed from gas into stars. Some galaxies are seen to be forming stars at a faster rate, but these so-called local starburst galaxies in no way compare with the formation process that took place eight to 10 billion years ago.

Telescopes can only show us the components of a galaxy that emit light. Hence, only stars, gas and dust are visible. Planets are much fainter, but in principle they could be seen using a powerful enough telescope. However, about 80 per cent of the total matter content in the Universe is of an exotic form – which has not been discovered yet. This dark matter neither emits nor reflects light. It is truly invisible matter that nevertheless exerts a gravitational force in galaxies, clusters of galaxies and the whole Universe. Unfortunately, its density is not high enough for detection in a laboratory. Only when vast, galaxy-sized regions are considered

Figure E

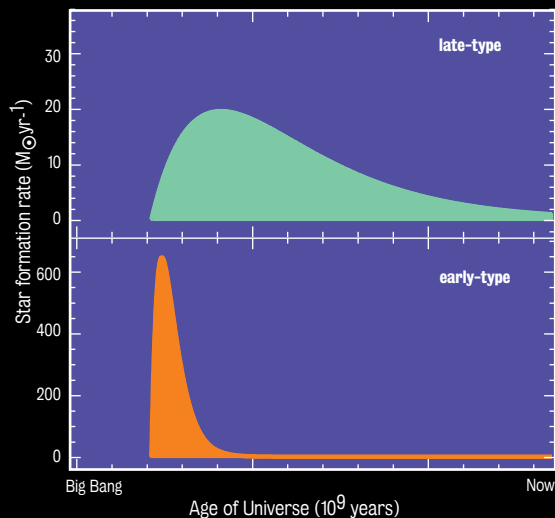
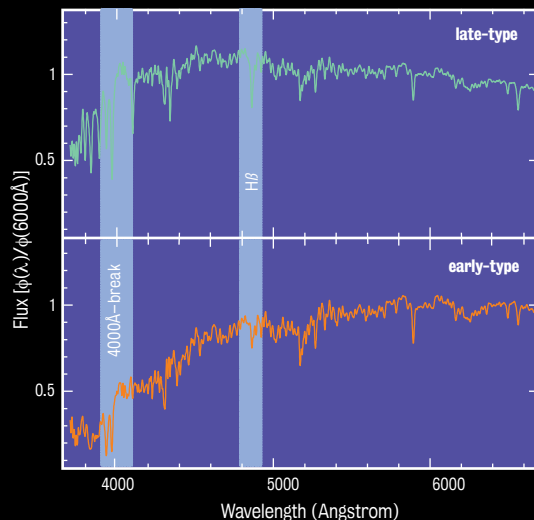


Figure F



can one feel its effect. If it were not for dark matter, galaxies could not have been formed. Hence, a galaxy is made up of two main components: luminous (ordinary) matter and a tenuous dark matter halo that extends over much larger distances than the luminous component.

Elusive halo

In order to detect this elusive halo we probe indirectly its effect on the properties of the visible galaxy. At King's we are exploring the dark matter content of elliptical galaxies by using gravitational lensing. A ray of light only follows a straight path if there is no matter along its trajectory. However, matter curves spacetime, thereby bending (and delaying) the motion of light. Some galaxies happen to lie very close to the line of sight of very bright, far-away sources of light called quasars. These interloper galaxies act as 'lenses', curving light rays and often generating multiple images of these background quasars. By studying the multiple images of these systems we can determine the mass (ordinary plus dark matter) that is responsible for this gravitational lensing. Using the same images we can also determine the

content in luminous matter. Along with collaborators at Queen Mary, University of London and the University of Minnesota, we have found that more massive galaxies have a much higher contribution from dark matter (see Figures C and D on page 63).

The puzzle of galaxy formation is being slowly resolved, resulting in a complex mixture of dark and luminous matter; star formation and galaxy mergers, from local galaxies out to the very primordial density fluctuations left soon after the Big Bang. Edwin Hubble himself would be surprised at the enormous advances made by extragalactic astrophysics in the recent decades – and in the decades to come.

● *Dr Ferreras was one of 60 new staff appointed by King's in 2005-6 following a thorough strategic review of the College's research profile. A new strategic investment fund was agreed to enable the College to build upon areas of strength and comparative advantage, to help make King's a truly global player in many areas. Particular emphasis was placed on reinforcing King's ability to work across traditional academic boundaries and exploit the practical applications of research.*

VALUING THE END



OF LIFE

King's is a world leader in the development of palliative care, policy and rehabilitation. Professor Irene Higginson describes the College's contribution to the past, present and future of this area.



One of the success stories of the last century is how much longer we are living. A person born in 1900 would live on average for 48 or 50 years, whereas someone born in 2000 can expect to live to between 75 and 80. Two important changes have brought this about. Firstly, fewer people are dying at an early age and secondly, everybody is living a little longer. In 1990, if a person reached 70 they would have another nine or 10 years of life on average. Nowadays, a person aged 70 in Europe, North America, Australia and New Zealand will have another 15 years.

As part of this 'population ageing', the pattern of diseases people suffer and die from is also changing. The last century saw a dramatic reduction in deaths from infectious diseases in infancy and childhood. Increasingly, nowadays, people die at older ages following illnesses due to serious chronic conditions and often with multiple ailments which can cause a wide range of physical, psychological and social problems. And when a younger person dies, it is often seen as unfair and unexpected, and follows a period of increasing illness and symptoms.

Hospice movement

Traditionally, research and care into improving the symptoms and support for people as their illness progressed were neglected. Around 40 years ago the modern hospice movement developed, with Dame Cicely Saunders in England leading the way. Dame Cicely, originally a nurse, then social worker, retrained as a doctor at St Thomas' Hospital, specifically to improve the way that dying people were cared for. Her work and that of others across the globe led to many improvements, especially for people with cancer and in pain control. However, it is only recently that programmes have developed more broadly. At King's, the Department of Palliative Care, Policy & Rehabilitation is pioneering ways to improve and understand the care and treatment of patients with symptoms other than pain and of those who have other illnesses besides cancer, and

Palliative care begins from the understanding that every patient has his or her own story, relationships and culture, and is worthy of respect as a unique individual.

to address the needs of those close to them.

Palliative care begins from the understanding that every patient has his or her own story, relationships and culture, and is worthy of respect as a unique individual. This respect includes giving the best available medical care and making the advances of recent decades fully available, so that all have the best chance of using their time well, with their symptoms better controlled and with dignity; and with those close to them also supported. Palliative care can be offered alongside treatments aimed to prolong life, but becomes more appropriate when an illness is not responding well to treatment aimed to cure, and when a person has complex problems.

Symptom control

Improving care for people with advanced cancer is an important part of our work. The World Cancer Report predicts that deaths from cancer will increase from 10 million people a year in 2000 to 15 million a year in 2020. Even with improvements in care and treatment, five-year survival from all cancers is projected to increase overall from 40 per cent to only 50 per cent by 2020, although this varies between cancers.

Even when cure is not possible, if patients live longer with their cancers and experience symptoms over a longer time scale, they will need symptom control over a longer period.

Working with the National Institute of Clinical Excellence (NICE) in 2003 we produced the evidence for the publication *Guidance on Supportive and Palliative Care in Cancer*. For this we had to review 13 different topics, taking account of experience across the globe, as well as within the UK. The College's many faculties in this area meant that we were ideally placed to undertake this massive project, and the production of the NICE guidance was orchestrated between departments in the Schools of Nursing and Medicine and the Institute of Psychiatry. The work is improving the way cancer care happens on the ground, with better training of doctors and nurses in communicating with patients and their



families, better information and improved funding going to hospices, and palliative care teams working in the community and in hospitals. Building on this work, King's is now co-leading a new national research collaborative project in supportive and palliative cancer care which brings together 61 different universities and hospitals.

One important preference for people with cancer is where they are cared for and where they ultimately die. For many, home is more than a physical space, representing familiarity, the presence of loved ones

and the possibility of enjoying 'normal' life.

Well over 50 per cent of people with a progressive illness want to be cared for and to die at home.

However, an analysis that we conducted for the World Health Organisation in 2004 showed that most patients in the UK, US, Germany, Switzerland and France die in

hospitals. In the UK, the percentage of home deaths for patients with cancer is falling, not rising: from 27 per cent in 1994 to 22 per cent in 2003. As a result of these findings, the Cicely Saunders Foundation has supported research to understand what prevents people dying at home when they want to, and how care at home can be improved. Preliminary findings from this work were published in the *British Medical Journal* in 2006, showing a new model and approach to improving care at home, and identifying 17 factors that were important in achieving this.

Misconception

It is a common misconception that the symptoms experienced by people with cancer are more severe than those experienced by people with other serious conditions. In contrast, our research found that people with different conditions often experience similar symptoms. Pain in heart failure, respiratory failure and multiple sclerosis

can be as common as for people with cancer.

Feeling fatigued and tired or weak and breathless is often more common for people with heart or respiratory failure than it is for those with cancer. This is important, because only around one in four people die from cancer, and more and more people will die from multiple diseases.

In response, we are now trying to understand the experience for people with diseases other than cancer. This is where the recent merger of the College's departments of palliative care and

rehabilitation medicine has been especially helpful, as both approaches are often needed for people with non-cancer illnesses. We are trying to understand the experiences of people with renal disease (especially those who are coming off renal dialysis or are too ill to be helped by it). This work has informed already improved services at



King's College and Guy's hospitals, by improving awareness of symptom prevalence, informing development of symptom control guidelines, and by emphasising the need for a flexible and responsive clinical service to meet patient need.

In October 2006 we and the Department of Nephrology & Transplantation organised a major international conference to highlight ways to improve the care of people with renal disease.

Neurology

Jointly with colleagues in King's College Hospital and the Institute of Psychiatry, we have also instigated studies to understand and improve the care of people with neurological conditions, establishing the King's Centre for Palliative Care in Neurology and extending its original remit to test a new palliative care service for people severely affected by multiple sclerosis to one for those with Parkinson's disease.

Palliative care is not just an issue for developed

Dame Cicely Saunders (1918–2005), pioneer of the hospice movement, was an alumna of St Thomas' and a Fellow of King's. The new Cicely Saunders Institute of Palliative Care will be named after her.

BARBARA GOMES

countries. For example, in sub-Saharan Africa there are an estimated 26 million people living with HIV, and every year around three million people die in the region either from HIV-related disease or from cancers. Deaths from cancers in developing countries are projected to increase by 70 per cent by 2020. These settings need quality palliative care too. The Department gave evidence promoting palliative care to the White House and, as a result, 15 per cent of the new \$15 billion US government funding dedicated to HIV/AIDS treatment, care and prevention was allocated to palliative care. Supported by the Diana, Princess of Wales Foundation and the US Government, we have appraised the models of care for people with HIV/AIDS and the services in Africa, suggesting ways to improve care.

Holistic needs

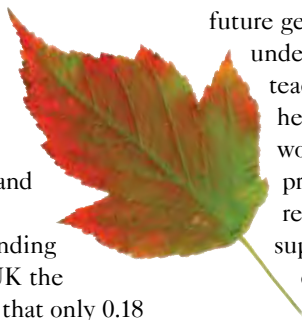
In both developed and developing contexts there is still a long way to go. Our multi-professional team of scientists, clinicians and researchers can offer a way to look at the holistic needs of someone affected by progressive illness – physical, emotional, social and spiritual. But there is a great shortage of doctors and nurses trained in palliative care and there are still many gaps in our knowledge. Obtaining research funding is still a major challenge – in the UK the 2002 government analysis showed that only 0.18 per cent of research funding in cancer was allocated to palliative care. In the area of non-cancer palliative care it is probably less. Our staff are, therefore, very grateful to those charities and others who do support this work. More doctors and nurses still need training. At King's there is training for undergraduate doctors and nurses in palliative care, and there is a highly acclaimed master's programme, training around 20-30 doctors, nurses and others from a wide range of countries each year. A recent evaluation of our course shows that almost all alumni are promoted during or soon



LOATES TAYLOR SHANNON

after the course, and all go on to train others in palliative care, with education being a major part of their future role.

In 2006 we received the go-ahead for one of our most exciting aspirations, and the culmination of over three years' planning and development: the creation of the world's first purpose-built Institute of Palliative Care, conducting high quality research, education, care and support: the Cicely Saunders Institute of Palliative Care. This project, working in partnership with the Cicely Saunders Foundation and our local hospitals, will enable close research collaboration between scholars and clinicians in palliative care and related disciplines from a wide range of local, national and international organizations. This project is named after Dame Cicely and it was particularly close to her heart: she was involved in the day-to-day development of plans only weeks before she died, and she saw this as a way of carrying her message forward for future generations. The Institute will provide undergraduate, master's and postgraduate teaching in palliative care for students and healthcare professionals from around the world. It will disseminate its findings to practitioners, policy makers, users and the research community, and will establish a support and information centre for patients, carers, professionals, educators, researchers and the public. The Institute's new £12 million building at Denmark Hill, funded by the Cicely Saunders Foundation, the Wolfson Foundation, the Weston Foundation, Macmillan Cancer Support and other donors including Atlantic Philanthropies, will provide space to significantly increase the number of academics working in palliative care and enhance the collaborations and infrastructure required to extend the breadth of research undertaken. Housing clinicians alongside academics will ensure research is quickly translated into patient care: valuing and improving life, even at the end of life.



Facts, figures and finances 2005-6

Students in Schools of study and location of academic activities

Head-count of enrolled students on 1 December 2005

School/Location	Campus	UG	PG taught	PG research	total	
Biomedical & Health Sciences	Guy's and Waterloo	2,256	370	213	2,839	14.7%
Dentistry	Guy's and Denmark Hill	855	100	55	1,010	5.2%
Humanities	Strand	2,088	401	249	2,738	14.3%
Institute of Psychiatry	Denmark Hill	40	390	330	760	3.9%
Junior Year Abroad & Overseas Exchange	Strand	158			158	0.8%
King's Institute for Learning & Teaching	Waterloo		99		99	0.5%
Law	Strand	956	693	51	1,700	8.8%
Medicine	Guy's, Denmark Hill and St Thomas'	2,085	207	165	2,457	12.7%
Nursing & Midwifery	Waterloo	2,878	136	50	3,064	15.9%
Physical Sciences & Engineering	Strand	1,306	398	123	1,827	9.5%
Social Science & Public Policy	Strand and Waterloo	1,061	1,255	321	2,637	13.7%
Grand total		13,683	4,049	1,557	19,289	100%

Student numbers by gender 2005-6

	UG students	PG taught	PG research	total	
Female	8,883	2,143	832	11,858	61.5%
Male	4,800	1,906	725	7,431	38.5%
Grand total	13,683	4,049	1,557	19,289	100%

Student numbers

by Age range 2005-6

	UG students	PG taught	PG research	total	
20 and under	9,002	13	3	9,018	46.8%
21-29	2,846	2,325	911	6,082	31.5%
30-39	1,160	1,120	412	2,692	14.0%
40-49	538	450	163	1,151	6.0%
50 and over	132	140	68	340	1.8%
Unknown	5	1		6	0.0%
Grand Total	13,683	4,049	1,557	19,289	100%

Students' country of domicile 2005-6

King's has a strong international community including students from over 130 countries.

Great Britain	79.7%
European Union	8.2%
Other countries	12.1%

Students in halls of residence (at 1 December 2005)

King's students in College residences	2,571
King's students in University of London intercollegiate residences	449

Staff (at 1 December 2005)

(excluding senior students, honorary and occasional staff)

Academic and research	2,954
Non-academic	2,195

Facts, figures and finances 2005-6

Income and expenditure (for the year ended 31 July 2005)

Income	£000
Funding Council grants	120,233
Tuition fees and education contracts	65,557
Research grants and contracts	101,463
Other operating income	69,843
Endowment income and interest receivable	6,876
Total income	363,972

Expenditure	£000
Staff costs	225,984
Depreciation	14,756
Other operating expenses	103,606
Interest payable	9,632
Total expenditure	353,978

Surplus on ordinary activities	9,994
Surplus on disposal of property	1,215
Surplus after depreciation of assets at cost and before tax	11,209
Taxation	9
Surplus after depreciation of assets at cost, disposal of property and tax	11,208

In March 2006 King's was once again awarded an 'AA-' financial credit rating from Standard & Poor's.

Acknowledgements 2005-6

The College is very grateful to all those who have so generously supported our work. The gifts we have received from individuals, grant-making trusts and other organisations have allowed us to undertake research, establish scholarships, create new academic posts and provide better facilities. We thank all those who have helped us fulfil our vision for the College, including donors who prefer to remain anonymous. In particular, we warmly acknowledge the support of the following:

7TM Pharma
Abbott Laboratories UK
Action Medical Research
AEA Technology plc
Airey Neave Trust
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Alzheimer's Research Trust
American Foundation for AIDS Research
Anatomical Society of Great Britain
Arthritis Research Campaign (ARC)
Arts and Humanities Research Council
Asthma UK

Astra Tech AB
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Banco Espirito Santo
Battens Disease Family Association
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British Eye Research Foundation
British Heart Foundation
British Library
British Retinitis Pigmentosa Society (BRPS)
British Skin Foundation
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Clinical Research Trust
Mrs Maryann Cochrane
Dr Jack Cohen
Colt Foundation



A sketch of Churchill by Field Marshal Lord Alanbrooke, from the Alanbrooke papers which have been purchased by the College's Liddell Hart Centre for Military Archives with the support of alumni and heritage charities.



Joey Lai Yi Chau, FKCLA Hong Kong and Kwok & Yi scholar, meets Mrs Teresa Cheng SC, board member of FKCLA Hong Kong, and the Chairman of College Council, Baroness Rawlings.

Comic Relief
Communities Scotland
Miss Mary Cooper
Dr John Crocker and Mrs Jo Crocker FKC
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Mr Clive R Debenham
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Department for International Development
Department of Trade and Industry
Diabetes Foundation

Diabetes UK
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 Mr Bill Dodwell
 Dormeur Foundation
 The D'Oyly Carte Charitable Trust
 Mr Geoffrey Driver
 Mrs Ursula Duckworth
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 Eli Lilly and Company Ltd
 Elimination of Leukaemia Fund
 Engineering and Physical Sciences Research Council
 European Commission
 European Orthodontics Society
 Food and Anaphylaxis Network (FAAN)
 Foreign and Commonwealth Office

Foundation Open Society Institute
 Association Française contre les Myopathies
 Friends of Guy's and St Thomas' Hospital
 Friends of King's College London (Canada)
 Friends of King's College London (Cyprus)
 Friends of King's College London (Hong Kong)
 Friends of King's College London (USA)
 Fund for Epilepsy
 Game Conservancy Trust
 The Bill and Melinda Gates Foundation
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 Guy's and St Thomas' Charity
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 Kidney Patients Association
 The Haberdashers' Company
 Dr Salim Habib FKC
 Hadwen Trust
 The Paul Hamlyn Foundation
 Lord Harris of Peckham
 Headfirst
 Health Effects Institute
 Healthsure Group Ltd
 Heptagon Proof of Concept Fund
 Hereditary Disease Foundation



GREG FUNNELL

The restoration of Thomas Guy's monument in the Chapel at the Guy's Campus was assisted by the Guy's and St Thomas' Charity.



The new Centre for Cell & Integrative Biology is supported by the partnership and backing of institutions including the King's College Hospital Charitable Trust.

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 The late Elizabeth D Hunter
 Professor BW Ife CBE FKC
 Institute of Brewing and Distilling
 Institute of Defence Analyses
 International Spinal Research
 Jacobsen Fellowship Committee
 Japan Foundation Endowment Committee
 State of Jersey Department for Education, Sports and Culture
 Johnson & Johnson
 Joint Research Committee
 Juvenile Diabetes Research Association
 Mrs Joyce OM Kastner
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 King's College Hospital Charitable Trust
 King's Fund
 Kingswood Golf & Country Club
 KMRT
 Mr William Kwan FKC
 Professor John D Langdon FKC
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 AG Leventis Foundation
 The Leverhulme Trust
 Dr Amalia Liguori
 London College of Fashion
 London's Transport Museum
 Dr Ian E Long AKC
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 Motor Neurone Disease Association
 Society for Mucopolysaccharide Diseases
 Multiple Sclerosis Society
 Muscular Dystrophy Campaign
 National Institute for Health (NIH)
 National Portrait Gallery

Natural History Museum
NERC

Novartis Pharmaceuticals UK Ltd
Novo Nordisk UK Research
Foundation

Nuffield Foundation
Old Possum's Practical Trust
OSspray Ltd

Oxford Biomedica Ltd
Parkinson's Disease Society
The Particle Physics and
Astronomy Research Council

Pfizer Limited
Phonologica Ltd
Procter & Gamble Inc

Psoriasis Association
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Sigrid Rausing Trust

Research into Ageing

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Dr Shafik Sachedina
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The Edmond J Safra
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The Cicely Saunders Foundation

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CBE

SC Johnson

The Schilizzi Foundation

Scios Inc

Seattle Biomedical Research
Institute

Smith & Nephew Medical
Limited

Speedel

Mrs Sylvia Spokes

Sir James Spooner FKC

Sport Aiding Medical
Research for Kids

Stroke Association

Sumitomo Pharmaceuticals

Swedish Ministry for Foreign
Affairs

Mr Robert Sweet

Dr Peter Swift

Sir Richard Sykes FKC

Tendera AB

The Grand Order of Water Rats
Charities Fund

The Inman Charity

The Oakdale Trust

The Sir Jules Thorn Charitable
Trust

Theravance Inc

Tommy's The Baby Charity

Professor Richard Trainor FKC

Tuberous Sclerosis Alliance

The Tubney Charitable Trust

Turner Syndrome Support
Society

Unilever Nederland Holdings BV

United States Army War College

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Wellchild

Wellcome Trust

The Garfield Weston Foundation

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Mr Christopher M Wiscarson

KC Wong Education Foundation

Mr Francis J Woodley

The Charles Wolfson Charitable
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The Wolfson Foundation

Wyeth Pharmaceuticals



A female mandrake from *Hortus Sanitatis* (1491). The Wellcome Trust is supporting a project to increase access to the St Thomas' Historical Collection by cataloguing the collection online.

JULIAN ANDERSON



The Henry Wellcome laboratories for Medical & Molecular Genetics, funded by the Wellcome Trust and the Guy's and St Thomas' Charity, were opened in November 2005.

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