

Imperial College
London

staying connected

ISSUE 28 SUMMER 2006 IMPERIAL'S HEALING HANDS_ENGINEERING
FORMULA ONE STYLE_MEDICS VS THE UNION: IMPERIAL VARSITY_UPCOMING
ALUMNI EVENTS_PLUS ALL THE NEWS FROM THE COLLEGE AND ALUMNI GROUPS

IMPERIALmatters

Alumni magazine of Imperial College London including the former Charing Cross and Westminster Medical School, Royal Postgraduate Medical School, St Mary's Hospital Medical School and Wye College.

in this issue ...



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IMPERIALmatters

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editorial



DEAR ALUMNUS

Welcome to the summer 2006 edition of your magazine, *Imperial Matters*.

This is an exciting time for Imperial. As we near our Centenary in 2007, we have an opportunity to reflect on our global position and how we have contributed to societies, and to think about how Imperial can continue to develop in the next 100 years. The recent move to withdraw from the University of London is one important change that will come right at the start of our second century. You can read more about why we made this decision, as well as other news from around the College, inside.

We also continue our series of features looking back over Imperial's history and heritage. In this edition, you can discover the eventful history of the Queen's Tower and how Imperial students contributed to the Home Guard during World War II.

Naturally, we are planning a range of celebratory events across the College during 2007 and there will be many opportunities for you to become involved, either through campus visits or remotely via our growing range of interactive offerings, from podcasts to live webstreams. To give you a flavour of what will be happening, we will send you a full programme of events later in the year. I would be delighted if you could come back to help us celebrate *100 years of living science*.

But you don't have to wait until 2007! There are plenty of opportunities to revisit the College before the Centenary, including our 2006 Alumni Reunion. The theme of the reunion is communicating science, and Imperial academics and alumni, many of whom are regular media experts, will deliver a fascinating programme of lectures. We are pleased to welcome Lord Robert

Winston as our keynote speaker, with his talk *Can we trust the scientists?* More about the reunion and other events on page 26. I look forward to seeing you there.

The Centenary will commemorate our proud heritage, but we are also looking to the future and the continuing contribution Imperial makes to improving quality of lives across the planet. Academics in the Faculty of Medicine, and the College's other faculties, are carrying out vital research to understand and treat the illnesses that affect people all over the world. On page 12, you can learn about some of our latest medical advances in surgery and handling influenza pandemics, among others.

It's not just the College making the headlines. Tim Goss and Mark Williams, two of Imperial's outstanding graduate engineers, are today instrumental in developing Formula One race cars for Team McLaren Mercedes. Read about them on page 16. And two Industrial Design Engineering graduates, Will Crawford and Peter Brewin, have also recently been awarded the prestigious Saatchi and Saatchi Award for World Changing Ideas for their invention Concrete Canvas; turn to page 28 to find out more.

Issue six of *building the connection*, our fundraising newsletter, is enclosed with your copy of *Imperial Matters*. As I sign off, I would like to acknowledge and express my great thanks to all of our generous supporters who are helping to make a difference to the lives of students at Imperial today.

Richard B. Sykes

Imperial Matters welcomes letters for publication, by post or email. We reserve the right to edit for length. Unless you specify otherwise, letters may also appear on the Imperial College alumni website as part of the online edition of *Imperial Matters*. Please note that any views expressed here are those of the contributors and do not necessarily reflect those of Imperial College London.

Sailing down memory lane

Tony Griffith's account of sailing on *Erivale* (A trip to remember, issue 27), in the 1950 Royal Ocean Racing Club race from Harwich to the Hook of Holland, resonated considerably with me. I was on the *Banshee* for the 1948 race, and *Erivale* was in that race too. Margaret Illing, daughter of Professor Vincent Illing from the Department of Petroleum, and also an Imperial College student, was another *Banshee* crewmember. I was much smitten by Margaret to the extent of virtual paralysis. We were like that in those days, or at least I was.

In *Banshee*, we did much better than we deserved, coming first in our division, which was for older boats. Roistering the previous night, doubtless also on Bols, we were two hours late at the start, having hit and stuck on a conspicuous wreck near the mouth of the River Orwell. We watched the rest of the fleet disappear, but the *Banshee* drifted downwind helped by a foul tide. By the time we got to the starting line a favourable breeze had set in and the tide was turning. We were the first round the Galloper Light.

DR PETER MARTIN-KAYE (Geology 1948, PhD 1954)

Raising the game

The question of engineering status raised by Bob Acutt (Letters, issue 26) is a perennial one, which appears never to be properly addressed. As a civil engineer, but mercilessly dismissed as lecturer from the University of Zimbabwe and as postdoctoral fellow from the University of Connecticut, and now literally fighting for survival in my own country, Malawi, I believe this is because of the low esteem with which engineering is held in our societies.

My contention is that the low status of engineering is because of engineers themselves. I cannot expect politicians, unless they have an engineering background, to support engineering and raise its status ahead of their own professions. The onus is, therefore, on engineers as individuals, companies and corporate bodies to do so.

My subsequent involvement in politics has shown that good and effective leadership of society is best executed through proper professionalism, which has passed the test of time and is based on our time-honoured traditions, which are in perfect harmony with our engineering professional rules.

Modern societies cannot run smoothly without engineering. The solution to our problems, however, can only come from inside so we should avoid back-to-frontism, shifting of blame and escapism, where innocent people are blamed.

DR ANDREW MPHONDE (MSc Civil Engineering 1977)



Happy days

Recently re-reading the winter 2006 issue of *Imperial Matters*, I was reminded, not of Southside Bar, which appeared on the scene only in the 1960s, but of its predecessor that sat on the north side of the quad (then filled with tennis courts), back under the right-hand side of the stairs.

It was a very small bar...but beautiful. Even during the 'drought' of the war years, when some pubs were so short of beer that sometimes they were offering only soft drinks, the Union Bar was never (well, almost never) without beer from a wonderful London brewer who kept the supplies coming in to us, even when he was unable to deliver to many of his other customers.

I seem to recall that a half-pint of bitter (it was rare that I could afford a full pint – and never on a dance night when I was faced with buying two drinks!!) cost 11 old pence, but I could be wrong on this. And of course there were the 'yards of ale'. These three-foot glass beauties held a pint in their bulbous ends. The requirement was to drink all of the beer as it gushed down the stem, without spilling any and to drain the yard in record time. Few got near the record, but it was amazing how little beer got spilt!! Do yards still exist these days?? Hey ho. Happy days.

CYRIL HIGGS (Chemistry 1943)

Wartime memories

The old photograph of the Imperial College Union in *Imperial Matters* (One hundred years on..., issue 27) reminded me of my own photograph of the same aspect, taken in 1944 or 1945, and memories of my time at the College.

I think women were excluded from the bar for something like 60 years, however there was one exception. The bar was managed by Jimmy Peacock, the Clerk of Works, and at times his daughter, known as Queeny, ran the bar. Jimmy Peacock and his wife also ran the Union Refectory; during the war the food there was notably bad.

Early in June 1944, there was an organised student protest against the quality of the food provided by the supplier, Doubleday. The call was 'Today is D-Day. Today refuse your Doubleday's meat pie and sausage'. Except for the weather, it perhaps would have been!

As President of the Royal College of Science Union (1943–44) and a member of the Refectory Committee, I met most of the management of the College. I remember Miss Sherwood, who manned the College switchboard with good humour and remarkable calm through the air raids, including one in which the bombs straddled the Beit Building and destroyed the Maison Française. The Secretary, Colonel Lowry, found flying bombs quite unbelievable.

DR BERNARD ATKINSON (Chemistry 1944, PhD 1951)

Where are all the chairs?

I was a young mother with three small children and did not have much time to go dallying in bars! However, I did go into Southside once or twice, and noted that the dining chairs were designed by Gordon Russell. There must have been at least 50 of them. How did I know who the designer was? I had five chairs of the same design myself, bought in Heal's in the 1960s.

The chairs have long been out of production, and over the years I promised myself I would ask Imperial College whether I could buy one of them. Eventually I had the time and energy to come up to Imperial – but the chairs had gone, and no one, but no one, could tell me where they had gone. These chairs are design classics! What happened to them?

DR ANGELA GUNNING (PhD Chemical Engineering 1971)

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Full-time MBA climbs into world's top 50

Tanaka Business School continues to rise in the *Financial Times*' MBA rankings, breaking into the world's top 50 and again being ranked number one for entrepreneurship in Europe.

The *Financial Times* has published its rankings for full-time MBA programmes every year for the past eight years. This year's rankings are based on research of 149 international business schools and information taken from 8,300 MBA graduates from 2002.

Tanaka Business School Principal, Professor David Begg, said the School was delighted with the results and optimistic about the future: "We have risen 30 places in the last three years and we are encouraged to see that we continue to be ranked the top school in Europe for entrepreneurship and in the top 10 worldwide. In purely financial terms, we remain in the top 25 in terms of value for money and twenty-seventh in terms of the absolute salary level achieved by alumni."

Professor Stefan Szymanski, Director of the Business School's full-time MBA programme, added that it was gratifying to see that planned improvements to the School's academic products continue to bear fruit: "There have been considerable changes to the Imperial MBA over the last three years and we believe that these will help to further improve the standing of our programme internationally. As well as the influx of a substantial number of new faculty members, which has expanded our research strength in entrepreneurship, finance and innovation, we have redesigned our programme material to focus even more sharply on the career needs of our students."

Mobile technology in healthcare

A report published by Vodafone Group, entitled *The Role of Mobile Phones in Increasing Accessibility and Efficiency in Healthcare*, shows how current mobile technology can increase productivity, improve patient health and enable greater access to healthcare.

The report, which contains research by Tanaka Business School in association with NHS Direct, the University of Dundee and the Office of Health Economics Consulting, is the first time that mobiles' contribution to healthcare has been systematically reviewed.

Dr Rifat Atun, Director of the Centre for Health Management at Tanaka Business School said: "This report has many examples of how mobile can increase efficiency, improve patients' ability to monitor and self-manage chronic conditions and promote better adherence to drug

treatment. All of this is delivered using basic mobile applications, voice and SMS (short message service). Healthcare policy makers and commissioners must introduce mobile systematically within healthcare if we are to take full advantage of its potential."

Mobile technology has the potential to support governments in their attempts to drive efficiency in healthcare costs and improve overall levels of service. The report demonstrates that the NHS in England alone could generate potential savings of between £240–370 million a year through the introduction of SMS appointment reminders to patients. It also highlights that an SMS support service for young people with diabetes could improve glucose levels by 10 per cent, potentially reducing the associated complications of blindness by 76 per cent and kidney disease by 50 per cent.

Weekend Executive MBA gets off to a flying start

Designed with the time-constraints of busy executives in mind, Tanaka Business School opened its new Weekend Executive MBA in May, with a small but significant group of students flying in from abroad.

Representing 18 different nationalities, the 58-strong inaugural cohort swapped career and travel advice as they settled in for their first weekend-long module. In addition to the UK residents attending the programme are students travelling in from as far afield as Switzerland, Gibraltar, Italy, Germany and Oman.

This new addition to the Business School's top ranking Executive MBA programme was created in order to give executives, both in the UK and abroad, the possibility of having an intensive experience without encroaching on their work schedules. Over the first year, from May to the following January, students follow monthly modules that start on Thursday afternoon and that run through the weekend to Sunday.

One of the key factors in the programme's appeal is its incorporation of e-learning into every facet of the curriculum allowing students to cover the basic theories, supervised by a tutor, in advance of modules. This gives the students much more time for interaction with their fellow students when they physically meet up and maximises contact with professors and tutors. Students bring each module to a close by applying in their workplace the knowledge they have acquired, using innovative collaborative workshops to discuss their findings and work with other students.

"Our Executive MBA programme has proved attractive to a wide variety of profiles. This kind of diversity, when experienced in a learning environment, greatly enhances students' experience and allows them to acquire real insights into each other's careers and exchange best practice" says Ebrahim Mohamed, Executive MBA Director.

>> NEWS IN BRIEF >>

The difficulties of monitoring outbreaks of avian flu A paper recently published in *The Lancet*, highlights the weak links in public health responses to containing avian influenza. The research analyses a number of countries, which, for geopolitical reasons, civil conflict or because they serve as military bases, are beyond the reach of the international system of public health. Many of these regions lie on the migratory paths of birds and are areas where avian influenza cases have been detected.

Inaugural lecture: uses of happiness data in economics Professor Robert MacCulloch gave his inaugural lecture, entitled *Uses of Happiness Data in Economics*, on 16 May 2006. Happiness research is based on the idea that it is fruitful to study empirical measures of individual welfare. The answer to a simple well-being question such as "Are you happy?" is the most common. Hundreds of thousands of individuals have been asked this question. Researchers have begun to use this data to tackle a variety of micro and macroeconomic questions.

The influence of genetics in entrepreneurship A new study from Tanaka Business School has found that almost 50 per cent of the factors that determine whether individuals become entrepreneurs can be found in their genes. The remaining factors that influence the decision to become an entrepreneur include environmental factors such as training, traditions and opportunities. The authors compared the difference in similarity rates for self-employment between identical and non-identical twins and were able to establish the importance of genetic and environmental factors.

The Royal Society offers first business programme The Royal Society has teamed up with Tanaka Business School to offer its first business programme for scientists, which covers science-based innovation, leadership skills and entrepreneurship. The 12-month course is made up of two three-day modules and one two-day module. The first module has just received a glowing evaluation from the 21 members of its inaugural cohort.

Deep in the centre of the Earth

The plume of hot material that provides Hawaii's volcanoes with its continuous supply of molten lava originates from a depth of almost 3,000 km, at the border between the Earth's core and its rocky mantle, suggests new research published in *Nature*. This is far deeper than had been thought possible by many scientists. The question of whether plumes, which are hot, narrow currents that well up in the mantle, rise from the boundary between the core of the Earth and the mantle that surrounds it, or from a much shallower boundary layer within the mantle, has been hotly debated.

The research proved the presence of material from the Earth's core by using a new type of mass spectrometer to analyse the isotope signature of the element thallium in Hawaiian volcanic rocks. Isotope analysis can reveal the physical, chemical and biological processes to which a single element has been subjected.

Dr Mark Rehkamper, Department of Earth Sciences and Engineering, said: "It is only recently that scientists have developed the ability to analyse these volcanic rocks in enough detail to reveal exactly where in the Earth's interior they came from."

The evidence that plumes originate at the core-mantle boundary suggests that the mantle constitutes one big convective system, rather than being made up of several layers. It also reveals that sedimentary material from the Earth's surface is subducted into the mantle to make its way back to the surface in the plumes, over time periods of one or two billion years.

Dame Julia Higgins announced as new Faculty Principal

Professor Dame Julia Higgins has been confirmed as the next Principal of the Faculty of Engineering. She will take up the post in October 2006 at the beginning of the new academic year.

Dame Julia joined Imperial College as a lecturer in 1976, and has been studying the behaviour of complex materials, particularly polymers, since. Her research group specialises in the use of neutron scattering techniques to investigate polymer behaviour. She was elected Dean of the City and Guilds College from 1993 to 1997 and was appointed CBE in 1996. She is currently Professor of Polymer Science in the Department of Chemical Engineering and Chemical Technology and Director of the Graduate School of Engineering and Physical Sciences at Imperial.

In a letter to staff, Imperial's Rector Sir Richard Sykes said: "I am delighted that Julia Higgins has agreed to lead the Faculty of Engineering. She is not only a leader in her own field, for which she has been recognised through Fellowships of the Royal Society and the Royal Academy of Engineering, she is also a passionate advocate of science and engineering in general and in particular for the raised profile of women in these disciplines."

Dame Julia succeeds Professor Julia King who will take up the post of Vice Chancellor at Aston University. Thanking Professor King for her contribution to the College since joining as Principal in 2004, Sir Richard added: "The Faculty has benefited greatly from her experience and enthusiasm, and I am sure her abilities will serve Aston well."

Leaning Tower's saviour wins public promotion of engineering medal

Professor John Burland, CBE, has been awarded the Royal Academy of Engineering's 2006 Public Promotion of Engineering Medal in recognition of his work generating interest in engineering amongst the public and the media.

Professor Burland's public profile, and that of his discipline, soared when he was enlisted by the international committee that formed to save the Leaning Tower of Pisa. He explained: "At the angle it was, we couldn't even get the tower to stand up on our computer model. That shows just how close to falling over it really was."

Professor Burland oversaw an 11-year project to carefully excavate 30 tonnes of soil from the foundations under the tower's northern side. The tower, which now stands at a five-degree tilt and should remain standing for another 400 years, was straightened by a full 45 centimetres.

Alongside endeavours such as these, Professor Burland has devoted significant time to public lecturing, particularly to young audiences. On winning the recent medal, he said: "It is for me a thrill and an honour to receive this award, especially as it recognises the work I have done with schoolchildren. I have always felt that it is in the schools that we have to demonstrate the excitement, the challenges and the personal satisfaction of engineering if we are to attract the best students into our profession."

Professor Burland's latest accolade sits alongside a raft of other awards including gold medals from the World Federation of Engineering Organisations, the Institution of Structural Engineers and the Institution of Civil Engineers. Professor Burland is a Fellow of both the Royal Academy of Engineering and the Royal Society.

>> NEWS IN BRIEF >>

Spin-out goes from strength to strength Imperial College spin-out InforSense has begun 2006 on a high. Its flagship integrative analytics platform, InforSense KDE, is now successfully providing enterprise decision support informatics for companies across a wide variety of industries from pharmaceutical R&D to healthcare, and sales/marketing to financial services. InforSense has added 17 new customers in a variety of business sectors during the first nine months of their financial year. With new product releases and a rapidly growing user base, 2006 looks

like a very exciting year for the company.

Amadeus Capital Partners joins Imperial College London in DTI project Imperial College has joined with Amadeus Capital Partners, the European technology investor, in a £250,000 project funded through the DTI's Knowledge Transfer Partnership (KTP). This pioneering partnership is the first time that a KTP has been set up between a university and a venture capital firm.

The project will identify emerging investment opportunities in the

energy and environmental sectors, in areas such as bio-energy and low carbon technologies and will be supported by Imperial's Energy Futures Laboratory.

First Young Women in Engineering Open Day Over 60 female school pupils between the ages of 14 to 16 had a taste of life at Imperial College when they attended Imperial's first Young Women in Engineering Open Day in February 2006.

The Open Day, which was conceived by students from the engineering union, showcased

engineering as an exciting discipline and aims to address the lack of women studying in engineering in the UK. Female volunteers showed visitors around the College, which was followed by a talk from Professor Maria Petrou, Department of Electrical and Electronic Engineering.

Beaming the internet across Europe Developing ways to connect homes and businesses to the internet without using wires is the aim of a new project, which was announced in May 2006. The research could help users across Europe to access the

Stardust

Two years ago NASA's Stardust spacecraft flew within 150 miles of the icy nucleus of comet Wild-2 to capture tiny grains of dust. In February 2006, the probe completed its three billion-mile round trip, and dust from the distant comet arrived in London enabling UK scientists to be among the first to take a close look at the samples.



The samples will enable a small group of London scientists, which includes Imperial College scientists, to investigate the theory that comets may have provided our planet with some of the water and organic material that allowed life to develop.

Dr Matt Genge, Department of Earth Sciences and Engineering, said: "It's tremendously exciting to have bits of known comet quite literally at the tips of our fingers. These few thousandths of a gram of dust may tell us more about comets than the last 100 years of telescope observations."

The Department's Dr Phil Bland will be using an X-ray instrument to analyse the mineral content of the tiny particles while they are still in the collector material, aerogel, without damaging them. He said: "Comets contain a record of the earliest stages of solar system formation. These tiny grains could be a big part of the puzzle of how planets formed from dust and gas."

The results of the London scientists' analysis will be published with those from the rest of the preliminary evaluation team, later this year.

NASA/JPL/CALIFORNIA INSTITUTE OF TECHNOLOGY



Prince Philip visits Constructionarium

His Royal Highness Prince Philip visited engineering students taking part in the annual *Constructionarium*, where students have just five days to tackle a challenging project, such as creating a seven-metre high version of the world's tallest vehicular bridge, the Millau viaduct in southern France.

The event is designed to give students hands-on experience of engineering in a realistic environment. *Constructionarium* enables Imperial engineering students to run their own construction sites, managing a construction project from start to finish, and working in all roles from chartered engineer to general labourer.

TOM WHIPPS

The students experience real risks, allowing them to rehearse the power and responsibility of making decisions that determine the success or failure of the project.

Each year, 80 students spend a week at the facility based at the National Construction College in Norfolk, replicating real life projects and working in teams of between 20 and 30. The teams are briefed by a client who negotiates contract terms and they can also gain advice from contractors and consultants, for a large consultancy fee. Marks are awarded for management, cost control, technical quality and safety.

Prince Philip visited on the students' last day and saw the projects in their final stages. He was given a tour of the different projects underway, and watched as students pulled a replica oil rig to the middle of a lake and stabilised it.

Constructionarium was shortlisted from 26 entries for the Educational Innovation Award by the Royal Academy of Engineering and BNFL. The team from Imperial College London, which designed the project along with partners in industry, narrowly missed out on the £10,000 prize but was presented in the Academy's symposium as an example of national best practice.

Grand designs

A plan for an engineering building with a study area that feels like a tranquil forest has won the *EnVision 2010* competition to design a purpose-built engineering learning space. Paul Lee and Harriet Tennent impressed the judges with the holistic design of their 'Lyceum' building, a low energy interactive building where students are involved in running the building's services as an accredited part of their course.

The design includes project spaces for team based learning; a drawing room for technical drawing and geological mapping classes; and a student run café. It also incorporates a quiet study area with tree-like columns to create a 'tranquil forest environment'.

The competition was launched as part of the *EnVision 2010* initiative, which aims to build on the Faculty of Engineering's already excellent international reputation and create a world centre for excellence in engineering education through innovations in teaching, the curriculum and learning spaces. The *EnVision 2010* team are hoping to use students' fresh ideas to help plan new engineering learning spaces within the College.

Dr Ruth Graham, Director of *EnVision 2010*, said: "This competition has been a great way to find out what the ideal engineering learning space looks like from a student's point of view. The strongest elements of all the entries will feed into the implementation phase of *EnVision 2010* and help us when we're thinking about how to revitalise many of the learning spaces at the College."

>> NEWS IN BRIEF >>

internet, by removing the need to lay out connecting phone lines or other cables between the public internet and a user's building or network. At present, although it is possible to make use of wireless technology within homes and office buildings, the connection from these buildings back to the public internet requires wires.

New Chair in Energy Materials

A new Chair is being created at Imperial College London in memory of Professor Brian Steele. Professor Steele, who worked in the Department of Materials at Imperial

College for 37 years, was instrumental in the development of solid oxide fuel cells. He was also a founding member of spin-out company Ceres Power, which is commercialising fuel cell technology.

The College is looking for a high profile, internationally-leading researcher to take up the B. C. H. Steele Chair in Energy Materials in October.

Six Imperial academics among new fellows of Royal Academy of Engineering

Professors Mike Graham, former Head of the

Department of Aeronautics; Morris Sloman, Deputy Head of the Department of Computing; Andrew Livingston, Department of Chemical Engineering and Chemical Technology; Peter Cawley, Department of Mechanical Engineering; and Geoff Maitland, Department of Chemical Engineering and Chemical Technology; were each elected as Fellows of the Royal Academy on 4 July 2006. The fellowships recognise the UK's most distinguished engineers.

They are joined by Professor Sir Ara Darzi, Head of the Division of Surgery, Oncology, Reproductive

Biology and Anaesthetics in the Faculty of Medicine, who is awarded an Honorary Fellowship.

Sir Ara has been at the forefront of developing new surgical techniques and technologies, making use of engineering to benefit medicine and healthcare.

Five alumni were also elected as Fellows of the Royal Academy of Engineering. They will be listed on the honours page in issue 29 of *Imperial Matters*.

Responding to a flu pandemic

Detailed data on population density and demographics, together with data on human travel patterns, has enabled a team from Imperial College, Johns Hopkins Bloomberg School of Public Health and RTI International to predict how a variety of interventions, including travel restrictions, school closures and antiviral treatment, would affect the spread of a flu pandemic using computer modelling.

Professor Neil Ferguson, Division of Epidemiology, Public Health and Primary Care, who led the research, said: "The modelling shows there is no single magic bullet which can control a flu pandemic, but that a combination of interventions could be highly effective at reducing transmission, potentially saving many lives."

The research shows that border restrictions are unlikely to delay the spread of influenza by more than a few weeks and restricting travel within a country is predicted to have an even more limited impact on slowing the spread of a pandemic. However, school closures combined with using antiviral drugs to treat cases, and people in the same household as cases, could halve the number of people getting ill in a pandemic. The impact would be even greater if people in the same households as cases also voluntarily stayed at home.

It also shows that vaccines need to be available within two months of the start of a pandemic to have a big effect in reducing infection rates. With current manufacturing methods, this means vaccines would need to be stockpiled in advance.

Hormone could reduce appetite and increase energy

A team from Imperial has discovered that injections of a hormone given to healthy overweight volunteers can affect food intake and increase levels of activity, which could be a potentially useful treatment for obesity.

Fifteen healthy overweight male and female volunteers, aged 23–49, completed three separate four-day study sessions, where they self-administered either saline or oxyntomodulin according to a double blind randomised trial. On average, the volunteers ate 128 kcal or 17.4 per cent less, while activity-related energy expenditure increased by an average of 143 kcal or 26.2 per cent.

Professor Steve Bloom, Division of Investigative Science, who led the research, said: "The discovery that this hormone has a double effect, increasing energy expenditure as well as reducing food intake, could be of huge importance. When most people diet, this produces a

reduction in activity, which is probably an adaptive trait to conserve energy during times of famine. In contrast, oxyntomodulin decreases calorific intake but actually increases energy expenditure, making it an ideal intervention for the obese."

Professor Bloom added: "This discovery could provide doctors with a whole new way to treat the current obesity epidemic. We need to get away from the focus on food and start to think about how to increase exercise. Oxyntomodulin could work by letting the brain know it has an adequate energy supply and that it can afford to do productive things rather than concentrate solely on food seeking or conserving energy."

Drugs like Vioxx may still be the best treatment for arthritis

Researchers from Imperial College London and Queen Mary, University of London, examined the use of selective inhibitors of cyclo-oxygenase-2 (COX-2) in a *Nature Reviews Drug Discovery* article, which was published in January.

They argue that although this class of drugs, which include Vioxx, has been associated with an increase in the risk of cardiovascular events such as heart attacks and strokes, the same may be true for traditional non-steroid anti-inflammatory drugs (NSAIDs).

All NSAIDs work by blocking the actions of both COX-1 and COX-2 enzymes. Blocking COX-2 relieves inflammation and pain, but blocking COX-1 can increase the risk of gastric ulcers and bleeds. For this reason COX-2 selective drugs were developed with the simple aim that they would retain the therapeutic actions of NSAIDs (linked to inhibition of COX-2) but lose the gastric side effects (linked to inhibition of COX-1).

Professor Jane Mitchell, National Heart and Lung Institute, and one of the article's authors, said: "Although some COX-2 drugs have been reported to increase the risk of heart attack and stroke, they may still remain the best option for treating arthritis in some patients without cardiovascular risk factors, who cannot tolerate traditional NSAIDs because of gastric side effects."

Professor Mitchell added: "This review shows us that despite the large scale use of NSAIDs and COX-2 inhibitors for a number of years, we still need more information on their benefits and potential risks and that more research needs to be done in this area."

>> NEWS IN BRIEF >>

Imperial top for Academic Clinical Fellowships

Imperial has been awarded the largest number of Academic Clinical Fellowships in England and Wales, gaining 126, nearly double its nearest competitor.

Academic Clinical Fellowships were set up to train the medical researchers of tomorrow by allowing doctors to spend time gaining experience in research and education without detracting from patient care. Twenty-five per cent of the doctor's time is reserved for academic training, by compensating the hospital for the loss of their time in clinical work.

Getting to the heart of cardiovascular diseases

The Magdi Yacoub Institute at the UK's Harefield Heart Science Centre, Imperial College London, and a unit of the European Molecular Biology Laboratory near Rome have announced the merging of their expertise to fight cardiovascular diseases, which are among the most common health problems and causes of death in the world.

The collaboration will initially run for four years and will formalise joint research projects. One focus will be to study the molecular mechanisms

that lead to heart failure, in hope of finding ways to intervene. Another topic will be a focus on heart transplantation and tissue engineering, aiming towards regenerative therapies.

Doctor of the Decade award for Imperial scientist

Professor Peter Barnes, Head of Respiratory Medicine at the National Heart and Lung Institute, has been named a *Doctor of the Decade*, according to *Science Watch*, an international newsletter that tracks performance in scientific research.

Professor Barnes, a leading expert on asthma, has been named as the thirteenth most cited author in clinical medicine in the world. He is the most cited medical author outside the USA, having received 16,148 citations between 1995 and 2005. He was one of the first to recognise the role of chronic inflammation in asthma and the importance of early treatment with inhaled steroids. This has since become standard clinical practice.

Robot-assisted surgery more accurate than conventional surgery

Robot-assisted knee surgery is significantly more accurate than conventional surgery, according to a team of surgeons who tested whether Acrobot, a robotic assistant, could improve surgical outcomes for patients undergoing unicompartmental knee replacement.

Acrobot works by helping surgeons line up the replacement knee parts with the existing bones. Of the 13 patients undergoing robot assisted surgery, patients' bones were lined up to within two degrees of the planned position in every case, however only 40 per cent of the conventionally performed cases achieved this level of accuracy. Although the operations took a few minutes longer using the robotic assistant, the recovery from surgery was quicker in most cases.

Professor Justin Cobb, Division of Surgery, Oncology and Reproductive Biology, who led the research team, said: "These robots are designed to hold the surgeon's hand in the operating theatre, not take over the operation. By showing how the increased accuracy makes a difference to how well a knee works after surgery, we will be able to develop a new generation of less invasive procedures without the risks of error, providing faster recovery and better functional outcomes for patients."



Link found between cat faeces and schizophrenia

Researchers that tested anti-psychotic and mood stabilising medications on rats infected with the parasite *Toxoplasma gondii* have found that the drugs were as, or more, effective at preventing behavioural alterations as

anti-*T. gondii* drugs. The research, which was published in *Proceedings of the Royal Society B* in January 2006, showed that when the rats were given the drugs the behavioural symptoms of *T. gondii* were

reduced and suicidal feline attraction, whereby rats become less aware of the dangers of cats, was limited. This has led them to believe that *T. gondii* may have a role in the development of some cases of schizophrenia.

Previous studies have indicated that some cases of schizophrenia may be associated with environmental factors, such as exposure to the parasite. Additionally, several of the medications used to treat schizophrenia have been shown to possess anti-parasitic properties. This led the authors to suspect that these mood stabilising medications reduce psychotic activity as a result of their inhibition of parasites.

Dr Joanne Webster, Division of Epidemiology, Public Health and Primary Care, said: "By showing that drugs used to treat schizophrenia affect the parasite *T. gondii*, this provides further evidence for its role in the development of some cases schizophrenia. It may be that anti-psychotic drugs work partly by parasite inhibition, and this could lead to new medicine and treatment combinations."

The researchers have begun human clinical trials using anti-*T. gondii* treatments as adjunct therapies for schizophrenia with researchers at Johns Hopkins University.

Age can improve quality of life

Old age and retirement do not necessarily mean a reduction in quality of life, according to research published online in the *Journal of Epidemiology and Community Health*. Researchers from Imperial College, Karolinska Institutet in Stockholm and City University, London, studied the effect of health factors, social factors and socio-economic factors on quality of life. They found that quality of life in England is above average between the ages of 50 and 84 and, in some cases, increases compared with earlier years.

Factors, such as long-standing illness, difficulties in moving about and carrying on with every day activities, depression or financial difficulties, can reduce quality of life. In comparison, trusting relationships with friends and family, frequent contact with friends and living in a safe neighbourhood resulted in an improved quality of life.

Dr Gopal Netuveli, Division of Epidemiology, Public Health and Primary Care, said: "Although many worry that old age and retirement could be a time of hardship, this study shows that for many their quality of life actually improves as they get older. In particular, social engagement such as volunteering can significantly improve quality of life, even in very old age."

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New healthcare technology training centre

A new £2 million NHS training centre, named the Training Hub for Operative Technologies in Healthcare, will help health workers to become skilled in using the latest medical technology. It will become a centre of excellence that will set the standards for training in the use of the most advanced technologies in healthcare.

The centre will work alongside universities and a wide range of companies in the medical device and high tech sectors, to develop and identify training needs for healthcare

staff operating emerging technologies, such as those used in minimally invasive therapies.

Student wins top young researcher prize

Leanne Bellamy, a fifth year medical student, has been awarded the Gregor Mendel medal as Britain's top young researcher in bioscience at the Science, Technology and Engineering Young Researchers Day. Leanne won the award for her research which looks at how pre-eclampsia in pregnant women can leave them at an increased risk of cardiovascular disease later in life.

Cannabis effective at relieving pain after major surgery

A cannabis plant extract, Cannador, is effective at managing post-operative pain for patients after major surgery such as knee replacements, a study by Imperial College London and the Medical Research Council has shown.

The researchers tested Cannador on 65 patients who had previously undergone surgery. The trial showed that minimal side effects were experienced at low doses and the research may lead to the development of a wide range of drugs.

See page 13 for more details.

Qatari leader visits Imperial

Her Highness Sheikha Mozah Bint Nasser Al Missned, Consort to the Emir of Qatar, visited Imperial College London in January to learn about the latest medical developments aimed at improving babies' health.

Imperial academics described the difficulties in delivering medicine to babies while they are still inside their mother and the use of new imaging technologies to improve outcomes for newborn babies, including the CoolCap study, which helps cool the brains of oxygen deprived babies, preventing brain damage.

Tomorrow's endangered species

Conservationists should be acting now to protect mammals from extinction in the future, according to research published in March. Species not presently in danger could have a latent risk of extinction if they inhabit regions or habitats still comparatively unmodified by human activity.

Among species with the highest latent extinction risk are the North American reindeer, the musk ox, the Seychelles flying fox, and the brown lemur, identified by comparing their current extinction risk and the risk predicted from their biological traits: body mass, rate of reproduction and geographical restriction. Hotspots for latent extinction risk in mammals include New Guinea, the Indian Ocean islands, Borneo, and northern Canada and Alaska, which are expected to experience population growth amongst humans over the next 10 years.

Lead author Dr Marcel Cardillo, Division of Biology, said: "We can see leapfrogging of extinction rates happening now. For example, the Guatemalan howler monkey, classified on the 'least concern' list in 2000, had moved to the 'endangered' list by 2004 as it lost much of its forest habitat. We hope conservationists will use our findings to pre-empt future species losses rather than concentrating solely on those species already under threat."



Cassini's progress

It has been a busy six months for spacecraft Cassini as it continues its mission to Saturn, where Professor Michele Dougherty, from the Space and Atmospheric Physics group, is Principal Investigator for the onboard magnetometer. In February, researchers noted Saturn, like Earth, produces electron beams which not only accelerate towards its auroral region but also away from it.

These 'anti-planetward' electrons puzzle scientists because they do not fit with current understanding that auroras are usually generated when atmospheric atoms become excited by the electrons that are accelerating towards the planet. It was previously unclear whether anti-planetward electrons were a unique feature of the aurora on Earth (known as the Northern Lights), even though auroras are found on most planets in our solar system.

In March, scientists confirmed that Saturn's moon Enceladus is the source of Saturn's E-ring. A plume of icy water vapour bursting out of its south pole replenishes the water particles that make up the E-ring

and creates a dynamic water-based atmosphere around the small moon. The E-ring is Saturn's outermost ring, stretching between the orbit of two of Saturn's moons, Mimas and Titan.

In May, the magnetometer was used to measure the rotation period in the magnetic field of the planet. Measurement of a rocky planet like the Earth is easy, but similar measurements for planets made of gas, such as Saturn, pose problems. However researchers from Imperial College London, NASA's Jet Propulsion Laboratory (JPL) and UCLA found a clear period in the magnetic field that they believe indicates a day of 10 hours and 47 minutes. This is a whole eight minutes slower than NASA Voyager results from the early 1980s.

According to Professor Dougherty: "Finding a period in the magnetic field rotation has been one of team's most important goals and will help us to understand the internal structure of Saturn's magnetic fields and from that, how the planet formed. After almost two years of collecting data, we are starting to get fascinating insights into Saturn, but we still have more questions than we do answers."

European inventor of the year nomination for Imperial physicist

Research carried out by Imperial's Head of Physics, Professor Donal Bradley, was recognised with a nomination in the first European Inventor of the Year awards in May for the invention of polymer light emitting diodes (PLEDs), a technology based on his discovery that certain plastics can be made to emit light.

PLEDs are now being used to create flat screen displays for consumer electronics devices that use less power than traditional technology while still providing high quality viewing characteristics.

According to Professor Bradley: "PLEDs are ideal for portable devices since they are light, durable and battery-friendly, yet retain a very desirable picture quality. As this technology develops, it will offer many new possibilities about how and where we can use a computer or watch television."

Professor Bradley is involved in two companies which are developing the potential of PLEDs: Cambridge Display Technology (Nasdaq:OLED) was founded with Jeremy Burroughes and Richard Friend at Cambridge University and Molecular Vision Ltd with Imperial College chemists John and Andrew de Mello.

The award nominees were selected from 380,000 patents awarded by the European Patent Office during the decade 1991-2000 for their

NASA-JPL SPACE SCIENCE INSTITUTE

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Mathematician wins 2006 King Faisal Prize_The King Faisal International Prize for Science, which recognises outstanding research, was presented to Professor Simon Donaldson. It recognises his contribution to theories of pure mathematics that have helped to form an in-depth description of the laws of matter at the sub-nuclear level.

As the President of Imperial's interdisciplinary Institute for Mathematical Sciences, Professor Donaldson is focused on applying his mathematical expertise to understanding and tackling global

scientific problems such as climate change and disease.

New Biophysics Chair at Imperial_A new Chair in Biophysics has been created in memory of Professor David Blow, the 'founding father of biophysics' who worked at Imperial from 1977 until 2004.

David Blow made his name through significant advances in protein crystallography, a process which enables the study of the atomic structure and function of a protein, which can in turn be used to develop more effective drugs and

medical treatments.

Professor So Iwata, formerly Professor of Membrane Protein Crystallography, has been appointed to the new Chair.

New material means 'X-ray specs' no longer required_Solid objects such as walls could one day be rendered transparent, according to researchers from Imperial College London and the University of Neuchatel, Switzerland.

The new optical effect is based on the development of a new material that exploits the way atoms in matter

move, to make them interact with a laser beam in an entirely new way. The technique could be eventually be used to see through rubble at earthquake sites, or look at parts of the body obscured by bone.

Metal forms unexpected bonds_Scientists are rethinking the potential of inorganic materials as new research reveals that the metal indium, found in group 13 of the periodic table, can bond by forming extended chains of indium-indium single bonds. This kind of bonding was thought to be confined to group 14 elements such as

technological impact. Only three nominations were made in each of six categories, with Friend, Burroughes and Bradley being recognised in the 'universities and research institutes' category. Although they were not the eventual winners, their nomination is the latest recognition of their pioneering work on polymer displays.

Scientists find cheats don't always prosper

According to research published in the journal *Nature* in May, selfishness is not necessarily the best survival trait for microorganisms.

The team of scientists, led by researcher Dr Craig MacLean of the Division of Biology, reported that studies of lab-grown yeast populations suggest the benefits of cheating are eventually counterbalanced by the costs. This contradicts classic evolutionary theory, which states that in a competition for common resources the long-term winner will always be the individual acting selfishly.

The scientists set up a series of competitions between 'cheating' and 'cooperating' strains, identical apart from the genes that determine how they convert energy. The cheaters produce energy rapidly by quickly taking in all the sugar they can, only partially converting it into energy; the cooperators produce energy efficiently by taking in sugar slowly and fully converting into energy all that they ingest.

The researchers were surprised to find that in a well-mixed population the cooperators were not excluded by the cheats because cheats accumulate toxins as a direct result of taking in resources more quickly than they can digest them, limiting the level of energy they derive from the sugar. This enables the cooperators to coexist over the long-term with the cheaters.

Scientists conjure true 'cloaking' device

A way to vanish matter before your eyes has become a serious possibility thanks to theoretical research announced in May by scientists from Imperial College and Duke University in the USA. When built, the device could achieve a similar magical effect to that seen in Harry Potter movies, where the trainee wizard dons a special cape and becomes invisible.

The researchers propose to build a special material that wraps around an object and which would 'grab' light heading towards it and make it

flow smoothly around the object rather than strike it. To an observer the light would appear to behave as if there was nothing there.

The special effects of the cloaking device would not be limited just to light rays, but would extend to all other field lines, including lines of force, suggesting other novel uses. Unlike other stealth or cloaking solutions currently in development, the proposed device would also operate across a range of frequencies.

"Ours would be a broadband cloak," says Sir John Pendry, Department of Physics and first author of the research. "In fact, shielding objects at the radio frequencies used by radar is where the device may eventually make the biggest impact."

Researchers at Duke University, are now attempting to build a metamaterial, that will do the grabbing of light and achieve this effect in reality.

£5.6 million award for London Centre for Nanotechnology

Developing new techniques for making precise measurements at the scale of one billionth of a metre is the focus of a new £5.6 million award for the London Centre for Nanotechnology (LCN), a joint venture between Imperial College London and UCL. It was the largest award made in the second round of the Science and Innovation Awards from the Engineering and Physical Sciences Research Council.

LCN is based in Bloomsbury and South Kensington and accesses the combined skills of the departments of chemistry, physics, materials, medicine, electrical and electronic engineering, mechanical engineering and earth sciences across the two universities.

Nanotechnology is already developing new materials and devices, such as tiny drug delivery systems for inside the body. However measurement at this scale remains a key issue, as it will play an increasingly important role in understanding the complexities of the way things operate at the nanoscale and in developing reliable manufacturing tools. The new award will enable the LCN to recruit four new academics, four postdoctoral researchers and 10 PhD students to tackle the current challenges involved.

Professor Tim Jones, Imperial's Co-Director of the LCN said: "Measuring things at the nanoscale is one of the biggest challenges to be overcome if we are going to move on from basic research and make nanotechnology happen in the commercial world."

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carbon and is most usually seen in carbon polymers.

The new indium compound has an unusual electronic structure that opens up possibilities for designing group 13 polymers, including new versions of electronic devices which are usually dependant upon entirely solid semiconductors.

Double win in international space science awards_The Zeldovich Medal, conferred by the Russian Academy of Sciences for outstanding contributions to space science, has been awarded to Imperial physicists

Marina Galand and Diana Shaul.

Dr Shaul is currently working on the Laser Interferometer Space Antenna project, which aims to test Einstein's Theory of General Relativity. Dr Galand receives the award for her research on the effect energy sources such as solar radiation have on the atmosphere of planets and moons.

Imperial researcher sets sights on TV stardom_Chemistry postdoc David Loong competed against nine other hopefuls in the June final of the *FameLab* competition, science's answer to *Pop Idol*, at the

Cheltenham Festival of Science. He impressed judges with his fast paced explanations of everyday science such as why jelly wobbles and how self tan cream works, but was eventually pipped to the post by winner, Jonathan Wood, currently the deputy editor of *Materials Today*.

Mayor of London visits Imperial_Mayor of London Ken Livingstone visited the lab of Professor Mustafa Djamgoz, Professor of Cancer Biology, in May, to be photographed as part of Marie Curie Cancer Care's *Back to the Floor* campaign, which sees bosses go

back to their first jobs. The Mayor began his career as a lab technician at the Royal Marsden Hospital working on cancer research.

Blue plaque for Imperial Nobel laureate_Dennis Gabor, a former Professor of Electron Physics at Imperial College London, who received the Nobel Prize for Physics in 1971 for his invention of holography, has been recognised with the unveiling of an English Heritage blue plaque at 79 Queen's Gate, where he lived between 1949 and 1961.

The best medicine

BY LIZ GREGSON AND ALEX PLATT
ADDITIONAL CONTRIBUTORS DR OMER AZIZ,
DR MARK ENRIGHT, DR CHRYSTALLA ORPHANIDES
AND PROFESSOR GUANG-ZHONG YANG

It is my pleasure to introduce this feature on the impact of Imperial's research in healthcare. What follows is a snapshot of some of our current areas of research focus. We have chosen subject matter that concentrates on some of today's big issues for healthcare, both in terms of gaining understanding about the diseases affecting large numbers of people around the world, as well as the development of new treatments to combat them.

It is not hyperbole to say that we have been spoilt for choice, given the successes of individuals and groups on so many fronts. Whilst it is impossible to do justice to the complete range of research activity in the area of healthcare across the College, these vignettes provide a glimpse of our activities at home and overseas across the breadth of basic, translational and clinical research.

This article has provided a good opportunity for some reflection on the current position of the Faculty of Medicine, and summer 2006 sees us in a very strong position, at the head of the Higher Education Statistics Agency tables for clinical medicine and with a research spend of over £100 million in 2004-05.

We live in remarkable times in terms of research and education; the landscape of medical research funding in the UK is undergoing a potential revolution, and the Faculty is looking to the future educationally with a view to developing healthcare leaders for the future. A new graduate entry medicine course is on the horizon, and we have been very successful in attracting by far the largest share of the new UK postgraduate academic medicine training posts.

I hope you'll enjoy reading more about how the Faculty, along with colleagues from across Imperial's other faculties, is rising to current and future healthcare challenges.

PROFESSOR STEPHEN SMITH
PRINCIPAL OF THE FACULTY OF MEDICINE

Advancing surgical practice



SENSOR-ENABLED 'SMART' SURGICAL TECHNOLOGIES

Over the past three decades, surgical practice has been

influenced dramatically by the introduction of new technologies. Minimally invasive (or keyhole) surgery has gone from being a concept to the norm for many types of surgery, with a reduction in post-operative wound size resulting in a significantly reduced post-operative recovery time, without compromising the quality of the operation.

Following on from this, advances in stereoscopic camera and visualisation technologies have added depth perception, while robotic surgery has improved the range and accuracy with which surgical procedures are performed. Despite these advances, the vast majority of surgical instruments remain 'passive' mechanical devices, offering the surgeon little in the way of feedback to their function and the properties of the tissues to which they are being applied.

The addition of sensor technologies has the potential to transform these instruments into 'smart' surgical devices, reducing procedural time and improving clinical benefit, patient satisfaction and safety. In large healthcare systems such as the UK National Health Service, this also has important implications for the cost of healthcare provision.

Professor Sir Ara Darzi and his team of surgeons, engineers and computer scientists in the Department of Biosurgery and Surgical Technology at the St Mary's Campus have been integrating new sensor technologies into 'passive' surgical devices to make them 'active'.

The **sensor-enabled dilator** is a device used to open blockages in the oesophagus. This process is currently undertaken using passive devices such as inflatable balloons or rigid plastic tubes which have the potential to tear and damage this muscular tube-like organ. The sensor-enabled dilator aims to reduce this complication by offering real-time feedback to the operator. The device is also designed for use in gastric reflux surgery to standardise the procedure and maximise chances of success.

The **smart surgical swab** is designed for use in most operations and contains a coated thread that allows its detection within a body cavity using an electro-magnetic sensor. The device aims to reduce the complication of swab-retention in deep body cavities. Currently swab location is undertaken by impregnating a radio-opaque substance within the swab that shows up on X-ray, which although effective, is time consuming and results in exposure to unnecessary radiation. The smart swab aims to make this process easier.

The **laparoscopic guidance system** is designed to assist the surgeon during keyhole surgery by augmenting the camera image to enhance shadows that aid the surgeon's depth perception. This has the potential to improve the surgeon's appreciation of the three-dimensional space that they are operating in, something that is very difficult with existing cameras and screens.

PAIN RELIEF

Pain after surgery continues to be a problem because many of the commonly used drugs are either ineffective or have too many side effects. As understanding of the neurochemical systems involved in pain processing improves, newer analgesic products are being developed, including analgesics made with cannabis plant extract.

A recent study by Imperial College London and the Medical Research Council showed how effective Cannador, a cannabis plant extract, was at managing post-operative pain.

The researchers tested Cannador on 65 patients who had previously undergone surgery. Eleven patients received a 5mg dose, 30 received a 10mg dose, and 24 received a 15mg dose. While all patients who received a 5mg dose requested additional pain relief, only 15 of those who received the 10mg dose and six of those on the 15mg dose did so.

As the dose increased, patients reported decreasing pain intensity and increasing side effects. Side effects included increasing nausea and increased heart rate in some patients. Dr Anita Holdcroft, Department of Anaesthetics, Pain Medicine and Intensive Care, and lead researcher on the study says: "These results show that cannabinoids are effective, and may lead to the development of a wider range of drugs to manage postoperative pain."

Head of Department, Professor Mervyn Maze, who was also one of the researchers, adds: "We thought cannabis might be beneficial in helping manage pain following surgery, as previous research indicated cannabinoids help top up the body's natural system for reducing pain sensation. This research proves it can be effective, with minimal side effects at low doses."

The study was conducted using patients from Chelsea and Westminster Hospital, Charing Cross Hospital, Northwick Park Hospital, King's College Hospital, the Manor Walsall, the Whittington, St Bartholomew's, University College London Hospital, West Middlesex and Ravenscourt Park Hospital.

The team's research was published in *Anesthesiology* in May 2006. Funds for the study were given by the Medical Research Council and the Westminster Medical School Research Trust, which is administered by the Chelsea and Westminster NHS Trust. The Cannador was donated by the Institute for Clinical Research, Berlin.

MRSA: TACKLING A SILENT KILLER

Staphylococcus aureus is a bacterium found in the noses of 30–50 per cent of healthy people from where it occasionally spreads to cause minor skin complaints such as pimples and boils. Serious invasive disease is rare but it can cause pneumonia, meningitis, toxic shock and septicaemia in healthy individuals.

Methicillin-resistant *Staphylococcus aureus* (MRSA) strains are those with resistance to commonly used antibiotics, first isolated in 1961. Until the mid-1990s MRSA was rare and easily treatable with alternative antibiotics, but this started to change as MRSA became more common and more resistant. Nowadays in UK hospitals more than 40 per cent of *S. aureus* from serious infections are methicillin resistant and these require treatment with intravenous drugs for 10–12 days prolonging hospital stay and increasing the risk of complications.

Dr Mark Enright, of the Department of Infectious Disease Epidemiology, thinks vaccination could be the way to tackle the current problems caused by MRSA. "Unfortunately we don't have many choices in terms of antibiotics as most MRSA strains are resistant to our most powerful types", says Dr Enright. "However, vaccination may prove a solution, especially for patients whose weakened immune system may leave them at greater risk."

Although the first cases of MRSA were spotted in the 1960s, it wasn't until the early 1990s that it came to prominence in the UK. He adds: "It was during this time we had a number of large outbreaks in hospitals around the country. While some hospitals were able to control their outbreaks, others weren't quite so successful, and this has left us in the position of having endemic MRSA in every hospital."

Dr Enright's laboratory has been involved with the testing of potential anti-MRSA products such as AQ+, a compound which coats bacteria, starving them by inhibiting the uptake of metals that they need to survive. This compound could possibly be used to treat infections, in gels for hand washing in hospitals and also to eradicate MRSA from patients and staff carrying the bacteria.

According to Dr Enright, the current system of pharmaceutical drug development, testing and approval has led to a dearth of truly novel antibiotics and this will not improve in the near future. "We are going to have to rely on different weapons to treat our most resistant bacterial enemies," he insists.

Dr Enright is currently working to see whether immunisation against MRSA is feasible for those patients most at risk and is involved with a UK-based company whose vaccine recently finished phase one clinical trials. Another approach being considered is the development of vaccine-like antibodies that can be used to treat people with MRSA disease.

With the media frenzy surrounding MRSA, Dr Enright is keen to set the record straight. "Although MRSA is depressingly common it is usually treatable, although the age of the patient and level of underlying illness often determine the patient's outcome."



Understanding disease

OBESITY EPIDEMIC: DOES NATURE HOLD THE KEY?

“Obesity kills 1,000 people a week in UK!”, “Miracle diet pill launched!”, “One billion overweight adults worldwide!”, “Eat yourself thin!”.

Every week the headlines suggest we are getting fatter and every week a new ‘miracle cure’ is launched. Yet the depressing facts show that the developing world is currently gripped by an obesity crisis that is spiralling out of control.

While the NHS buckles under the sharp rise in incidence of obesity-related diseases such as type two diabetes, heart disease and obesity induced cancer, the truth is that there is currently no effective solution. Despite costly public health initiatives we seem unable to resist cheap, tasty, fat laden foods. Gyms have sprung up on every corner yet our dislike of exercise means that, rather than feel the burn, we prefer to laze in front of our plasma screens and computers.

To date, only risky gut surgery for extreme cases has proved effective in causing permanent weight loss. However, for over 30 years, the Department of Metabolic Medicine at the Hammersmith Campus has taken a different approach to solving this problem by studying the body’s own method of controlling appetite – the complex mechanisms between the gut and brain that regulate body weight.

Weight is maintained by a balance between food intake and energy expenditure; obesity results when food intake exceeds energy expenditure. Researchers in the Department have found that an individual feels less hungry after a meal because hormones released by the gut and transported via the blood to the brain, give information on fullness or ‘satiety’ that serves to regulate appetite. These naturally occurring regulators of appetite, the gut hormones, could hold the key to obesity therapy.

The research group, led by Head of Department, Professor Stephen Bloom, has recently published work regarding one such hormone, oxyntomodulin. They called for healthy overweight volunteers to give themselves oxyntomodulin injections, just before each meal, three times a day over a four-week period. With the brain being fooled into thinking they had eaten a large meal, those receiving oxyntomodulin subsequently ate much less than the control group and lost, on average, half a kilogram each week.

The results showed that, not only did this natural appetite regulator decrease appetite, the participants’ energy expenditure was significantly enhanced and their enjoyment of food was not affected. The weight loss after four weeks of oxyntomodulin therapy was found to be due to a reduction in fat and the rate of weight loss was greater than with any currently licensed weight loss drug.

PANDEMICS: PLANNING FOR THE UNPREDICTABLE

Staff in the Department of Infectious Disease Epidemiology, based at St Mary’s Campus, carry out world class research and provide advice to government on a wide range of infectious diseases and pathogens, including HIV and AIDS, pandemic influenza, foot and mouth disease, SARS and bioterrorism. The Department uses computational techniques in database analysis and mathematical modelling to analyse both transmission dynamics and disease

control, collaborating widely with colleagues around the world through organisations such as UNAIDS, UNICEF and WHO.

The threat of an avian flu pandemic is the most recent infectious disease to hit world headlines and, in August 2005, Professor Neil Ferguson of the Department was the lead researcher on a study which appeared in *Nature*. The study offered advice to governments around the world about how best to prevent a global pandemic of avian flu costing millions of lives.

Researchers simulated an outbreak of a H5N1 influenza virus in rural Thailand which mutated to become transmissible from person to person. Currently very rare, if the virus were to become more transmissible from person to person, the consequences of a global pandemic could be disastrous. According to the model, to limit an outbreak to fewer than 200 cases, two key conditions need to be met. Firstly, the virus would need to be identified whilst infection was confined to around 30 people.

Secondly, courses of antiviral drugs would need to be given rapidly to 20,000 individuals at the same schools, workplaces and in the same geographic area as the infected people. In order to be in a position to give treatment quickly and because of current manufacturing methods, vaccinations need to be stockpiled in advance, with 20 per cent of these targeted at children.

According to Professor Ferguson, the strategy needs to be one of containment at source. If the disease spreads to several locations, containment would become too resource-heavy to be effective. He says: “Stopping an emergent pandemic in its tracks at an early stage is the only strategy which could have a dramatic impact on the levels of death and disease that a new pandemic would cause.”

IMPROVING THE ODDS FOR CANCER PATIENTS

The key to successful treatment of breast cancer is to build on the science already in place and to combine new and old treatments to better effect, according to Professor Charles Coombes, of the Department of Oncology.

Over the last 20 years, the death rate of patients with hormone-receptive breast cancer has been halved by the use of chemotherapy and a course of the drug Tamoxifen, although currently 40 per cent of patients with the disease will still die.

Professor Coombes and his team have pioneered the use of a new therapy involving the traditional Tamoxifen treatment and a new drug, Exemestane. Results of a clinical trial showed the sequence of the two drugs improved survival by 17 per cent, raising the overall improvement in survival due to endocrine therapy to almost 50 per cent, with the possibility that many patients will not need the more toxic cytotoxic chemotherapy.

Breast cancer cells in these patients need oestrogen to grow. Tamoxifen works by blocking the effects of the body’s natural oestrogen. Exemestane, however, halts the natural production of oestrogen almost completely. Although Tamoxifen has been the gold standard treatment for many years, cancer cells can become resistant to it and it is the job of Exemestane to ‘mop these up’ by depriving any remaining cells of oestrogen, leading to fewer patients presenting with a secondary cancer years after their initial treatment.

“The methodology of screening for breast cancer must be improved still further,” says Professor Coombes. “If you kill the cancer cells early you have a chance of curing the patient, which unfortunately isn’t always the case in other types of the disease.”

One aspect of screening developed at Imperial is focused on the early detection of rogue cancer cells, which have evaded treatment and may go on to cause a secondary cancer. Professor Coombes and his team have developed a system which magnetically enriches cancer cells allowing powerful magnets to detect a single cancer cell in a sample of patient's blood.

Professor Coombes is hopeful for the future. He says: "The dual approach of testing and understanding cancer cell resistance, combined with the ability to target these obstacles, will mean a real hope for more women."



New patient monitoring techniques

PREDICTING DRUG RESPONSE: A NEW TECHNIQUE

Not all drugs are effective in all patients and in rare cases adverse drug reactions can occur in susceptible individuals. To address this problem, researchers from Imperial, led by Professor Jeremy Nicholson of the Division of Biomedical Sciences, have been working with scientists at Pfizer to explore new methods for profiling individuals prior to drug therapy.

Research published in April 2006 in *Nature* demonstrates this new approach, termed pharmaco-metabonomic phenotyping. It uses a combination of advanced chemical analysis and mathematical modelling to predict drug-induced responses in individual patients. The method is based on analysis of the body's normal metabolic products, metabolites, and metabolite patterns that are characteristic of the individual, from urine or other biofluid samples. The authors hypothesise that these individual patterns can be used to diagnose diseases, predict an individual's future illnesses, and their responses to treatments.

The researchers tested their approach by administering paracetamol to rats, measuring how it affected their livers and how it was excreted. Before giving the dose they measured the levels of the natural metabolites in the rats' urine samples. Metabolites are small molecules produced by normal body functions, and can indicate a body's drug response. After creating a pre-dose urinary profile for each rat, the researchers used computer modelling to relate the nature of the pre-dose metabolite profile to the nature of the post-dose response.

Professor Nicholson says: "This new technique is potentially of huge importance to the future of healthcare and the pharmaceutical industry. The pharmaco-metabonomic approach is able to account for genetic as well as many environmental factors, and other important contributors to individual health such as the gut microfloral activity. These factors strongly influence how an individual absorbs and processes a drug and also influence their individual metabolism, making this new approach the first step towards the development of more personalised healthcare for large numbers of patients."

The new methodology is in early stage development and will now be studied in humans to evaluate its possible clinical application. Researchers hope the discovery, which is not limited

to individual genetic differences, will be a key component in the pharmaceutical industry's aim to understand how patients might benefit from more individualised therapies, allowing doctors to personalise drug treatments for some individuals or specific patient groups, at a tailored dose-range for maximum efficiency and safety.

BODY SENSOR NETWORKS

With demographic changes associated with an ageing population and an increasing number of people living alone, the social and economic structure of the UK's society is changing rapidly. Older adults of 65 and above already constitute one-fifth of the total population, and it is expected that this will continue to grow. The flip side to this longevity is age-related disabilities and diseases. The need for effective individualised health monitoring and delivery is the primary motivation for the development of Body Sensor Networks (BSNs).

Although extensive measurement of biomechanical and biochemical information is possible in most hospitals, this diagnostic and monitoring utility is generally limited to brief time intervals. Professor Guang-Zhong Yang, Research Director at Imperial's newly formed Institute of Biomedical Engineering, and his team have been responsible for developing the technology behind the BSN. He says: "All branches of modern medicine rely heavily on early, accurate, and complete diagnosis followed by close monitoring of the results. To date, monitoring is undertaken by intermittent contact which produces a series of snapshots at personal, biochemical, mechanical, cellular, or molecular levels."

The ultimate aim of the BSN is to provide a truly personalised monitoring platform that is pervasive, intelligent, context-aware, and invisible to the patient, thereby avoiding activity restriction or behaviour modification. It is expected that the concept of BSNs will attract a range of applications, from monitoring of patients with chronic disease and care for the elderly, to general monitoring of well-being and performance evaluation in sports. To promote widespread use, there are a number of technical challenges that need to be tackled, including better sensor design, biocompatibility, power source miniaturisation, low power wireless transmission and secure data transfer.

A pilot study utilising BSNs to monitor the post-operative recovery of surgical patients is currently being undertaken at St Mary's Hospital led by Professor Sir Ara Darzi. Patients are fitted with a wireless 'earpiece' containing several physiological and motion sensors that monitor their heart rate, blood oxygen level and mobility at home prior to surgery. The same system is then fitted following discharge from hospital and is used to monitor post-operative recovery back to normal.

It is hoped that this technology will have a dramatic impact on the pre-operative assessment and post-operative monitoring of surgical patients across specialties. Professor Sir Ara Darzi said: "In today's healthcare systems new technological solutions are needed to give us the capacity to look after large populations of patients in their home environments. For these patients the current monitoring systems are too expensive and labour intensive to be effective. Pervasive healthcare as a concept and BSNs as a technology could form a key part of this solution."

Full throttle

FOLLOWING THE BRITISH GRAND PRIX IN JUNE 2006, IMPERIAL MATTERS MET TWO OF MCLAREN RACING'S CHIEF ENGINEERS TO FIND OUT ABOUT THE CHALLENGE OF DESIGNING AND DEVELOPING A COMPETITIVE FORMULA ONE CAR.

BY ZOË PERKINS



AS LONG AGO AS AUGUST 2004, IN THE IMPRESSIVE MCLAREN Technology Centre, work was beginning on the MP4-21, the Team McLaren Mercedes car destined for the 2006 Formula One World Championship. The car is strongly influenced by its predecessor the MP4-20, which was widely recognised as the fastest car on the 2005 grid. Chief Engineer MP4-21, Tim Goss (Mechanical Engineering 1985) explained the reason behind this: "Formula One cars are almost always some form of evolution from the previous season. Because you're continually developing the car and learning from experience, it would be wrong, nowadays, to take radical leap into an area that you don't particularly have experience with."

Tim, supported by a strong team of engineers, is responsible for the specification, research, risk management and development of the 2006 racecar. He explained: "I'm responsible from the start of the project, from its original conception, right through the research process, design, the early testing of the car and now the race exploitation and performance development of the car."

During his time at McLaren, Tim has taken on many roles. He explained how this benefits his current role: "It's actually given me quite a broad background, from the heavily theoretical side of engineering a Formula One car, as Head of Vehicle Dynamics, through to the very practical side of the vehicle, as Test Team Engineer looking after the engineering and development of the car at track tests."

Despite the similarities of the cars from one season to the next, it was not simply a case of wheeling the MP4-20 out again at the beginning of this season. Formula One's governing body, the Federation Internationale de l'Automobile (FIA), imposed a wide range of changes to both the sporting and technical regulations for the 2006 season. Not least among the changes was a reduction in engine size, from 3.0-litre V10s to 2.4-litre V8s. However, despite the loss of approximately 200 brake horsepower (bhp), a 20 per cent reduction in comparison with the 2005 season, lap times have only decreased by an average of 0.92 per cent, as cars are able to

spend longer at full throttle, with many high speed corners now taken flat out.

Regulatory changes have not been confined to the engine however, as Tim points out: "On the aerodynamics there was what seemed like quite a small change to the height of one of the hydrofoil side wings at the front of the car. But it actually had quite a large impact on the aerodynamic performance of the car, both at the front of the car and the rear, as a result of how the side wing vortices pass down the floor of the car."

Another challenge that the team faced were the changes to the qualifying format, which has been divided into three parts and now follows a knock-out system. These weren't defined until the end of October 2005, restricting decisions about fuel capacity and the layout of the car. When asked whether the regulatory changes have made his job more difficult, Tim replied: "No, it just makes it more fun. There are more things to think about."

Work on the engine formed a large part of the initial work on the car, as Tim explained: "Once the engine capacity and rule changes were announced, Mercedes-Benz High Performance Engines immediately started on the design of a new V8 engine. At that point we were also thinking about how we can package that in the car to get the most out of it."

The new engine completed around 2,000 kilometres on a dynamometer (or dyno), simulating the loads and environment a race engine encounters to prove its durability, during the three months prior to its track debut at Silverstone in September 2005. However, at this stage the team was not ready to reveal the planned bodywork for the upcoming season, as Tim described: "We designed and built a mule car, which was the MP4-20, with the 2006 engine."

The design of the car ran alongside the engine development, with the early priorities of determining the vehicle fundamentals, which include weight distribution, fuel capacity and aerodynamic packaging.

The team uses a process of rapid prototyping, which generates complex three-dimensional objects directly from computer-based models devised by computer-aided design (CAD), to translate the car from design into mock-up: "Early in the design and build process we rely very heavily on a mock-up car. While CAD drawing systems are particularly good these days at modelling things in three dimensions and helping with packaging, we do actually mock up some of the more complicated areas of the car, which are particularly congested, in particular wiring and hosing routes. We use a use a lot of rapid prototyping to produce that mock-up."

By December 2005 work to build the new car was beginning, however testing of components for the new car was already well under way. Winter testing, which began just six weeks after the final race of the 2005 season, is frequently directed towards long runs to evaluate the reliability of the car. Team McLaren Mercedes completed a massive 12,645 kilometres in testing. Tim explained: "We're not in the business of just producing a reliable car, we're in the business of producing a quick, reliable car, and that does actually mean taking some risk. It's one of the challenges of the job to get that balance right between performance and reliability."

Going into the 2006 season Team McLaren Mercedes were tipped as one of the favourites to fight for both the driver's and constructor's titles. Having achieved five podium finishes since the beginning of the season, McLaren currently lies third in the constructor's championship, but for such a competitive team, that's just not good enough, as Mark Williams (Mechanical Engineering 1980), Chief Engineer, Vehicle Dynamics, revealed: "I would say that our performance was probably three tenths off where we wanted to be. We've raced very well because we are a very good race team, but we haven't been quick enough and we're working flat out to try and resolve that."

Mark's role covers all aspects of potential car performance improvement, both in the short and long term. Mark, who always aspired to being a racecar engineer, explained further: "I get involved in every aspect of the car's development, outside of the engine and the aerodynamics, although I will be involved in that from a car handling perspective. Anything that could make the car go faster, I'll get involved in."

Mark gained experience through Formula Ford, Lola Cars' IndyCars and Formula 3000 programme, then Touring Cars, before a job running the McLaren F1's Super Touring Car programme came up. In 1997, Mark moved into the Formula One programme: "It's great to get involved in Formula One, because at the end of the day it's the top motorsport category. We work with the best drivers and the best engineers," he said. Since joining McLaren, Mark has also filled a number of other roles. "I was Test Team Engineer for four years, which I thoroughly enjoyed. But I love working with the cars, I love bringing performance to the cars. Having started out as a designer, I've worked more and more on the performance side over

the years and found that's what I wanted to get back into."

Each team up and down the pitlane is relentlessly developing and testing their cars throughout the season to gain competitive advantage, as Mark explained: "If you don't develop your car, you'll go backwards down the grid rapidly, because everybody is decreasing laptime. You have to run to standstill."

He added: "Some of the things we bring to the car bring a small laptime measured in milliseconds, but when you add them up, you get to hundredths and you get to tenths, but it's absolutely vital that you add laptime to the car during the year."

Since the Bahrain season opener in March, McLaren's development has been intensive and already many new components have been brought to the car, which typically accelerates from 0–100 miles per hour in 3.6 seconds, as Mark described: "The engine has had three new phase releases to the significant internal components, which will improve the performance because it's more powerful. Aerodynamics – we've had several front wing developments and we've had underbody developments."

When asked whether the team had seen an improvement in performance as a result of these developments, Mark replied: "Relative to where we started, yes. We've made the car significantly quicker, but so have the opposition. So what we're somehow looking to do is to make a jump in performance."

Every major component and structure of a Formula One car is systematically tested before and after the car is built to assess whether the components that looked good in simulation deliver the bottom line – performance improvement.

Following the British Grand Prix, McLaren spent three days at Circuit Paul Ricard in France in preparation for the forthcoming races in Canada and the United States. With more than 20 per cent of each lap at the Circuit Gilles-Villeneuve in Canada spent under braking, brakes were one of the main areas of focus, as well as general aerodynamic and setup work and specific tyre selection for the United States Grand Prix at Indianapolis.

However, as Mark revealed testing is not always as cut and dried as registering a faster laptime on the stopwatch: "There's always a risk of something being such a subtle improvement that in some circumstances it may actually not be quicker – it could have been quicker on that day, at that circuit. You're looking for something that appears performance neutral, but by simulation is quicker. If you get good driver feeling, the simulation results say it's OK and it appears performance neutral – it's probably better."

Mark was positive about the outcome of the test at Paul Ricard: "I would say it was probably about 60 per cent successful, which I think is a pretty good return." In the ever secretive environment of Formula One, that was all that Mark could reveal! But with half the season remaining, there's plenty of time to find out how much laptime Tim, Mark and the rest of Team McLaren Mercedes are able to bring to the car.



IMPERIAL MATTERS SPOKE TO SOME OF THE COLLEGE'S MSc IN SCIENCE COMMUNICATION ALUMNI WHO ARE UNDERTAKING A RANGE OF ROLES COMMUNICATING SCIENCE.

Communicating science

BY ZOË PERKINS



ANDREW COHEN (1995)
Series Editor *Horizon*, BBC TV

Andrew took over his *Horizon* role at the end of 2005. He explained what it involves: "I am responsible for delivering 18 documentaries each year to BBC.

This involves the development, commissioning and production of a range of science documentaries, produced by a team of approximately 40 people."

Conveying complicated scientific material is one of the challenges that Andrew faces in his role, as the documentaries have to be understandable and entertaining for the audience. The first series of *Horizon* involving Andrew as editor includes a documentary about the forensic operation following the Indian Ocean tsunami in 2004. The documentary took a unique perspective, looking at the scientific aspects of identifying the thousands of people who had died, as well as the emotional importance of this to their families.

After studying physiology and pharmacology, Andrew embarked on his career in science to communication. He said: "I started at the BBC as a work experience runner as part of my degree, and I've never left. I have worked as a researcher, assistant producer, producer, series producer and executive producer on a range of science programmes, from *Tomorrow's World* to *Brain Story*."

When asked whether he enjoyed his job, Andrew replied: "For me it's the best job in science television."



MICHELLE MARTIN (1999)
Producer, BBC Science Radio Unit

Michelle's first role since graduating in 1999, was as a researcher on a children's television science show that involved designing toys from straws and sticky-backed plastic! Of this role, Michelle commented:

"I was amazed that work could be so much fun." Michelle also worked for the Science Museum before she joined the BBC.

Michelle's current role is as a producer for the BBC's Science

Radio Unit. She explained what this entails: "My day is spent finding ideas, recording interviews and editing radio documentaries and discussions. I'll contact scientists, health professionals and patients, to chat to them about their research and experience."

"Once I've narrowed down what I'm going to include in the programme, I'll brief the presenter and who will interview them. Finally I take the raw interviews and edit them together, weaving in music, script and sound effects," she continued.

Michelle feels a great sense of achievement getting each programme on air: "I get to travel to amazing locations and see a side of life that tourists aren't normally exposed to – from hurricane regions in Florida to townships in Johannesburg. It's rewarding to go out there with nothing and end up with a programme."

The MSc at Imperial has been a great help to Michelle's career. She said: "Media is notoriously difficult to break into, but the course has a fantastic reputation across the science communication industry for turning out intelligent, capable graduates and I don't think I'd be here without it."



HAZEL MORRIS (2003)
Press Officer, Medical Research Council

Prior to her current role at the Medical Research Council (MRC), Hazel gained experience through a number of shorter placements. "I worked at *New Scientist* magazine, BBC Radio Scotland and as a writer in the press and publications office at the particle physics laboratory CERN in Geneva." She explained.

"I spent two years working for the Association of Medical Research Charities," she continued, "where I wrote web content and coordinated the organisation's science communication award.

Hazel is kept busy in the MRC press office: "Life in the press office is fast paced. Translating cutting edge research is a challenge that really does teach you something new everyday. I write press releases and web stories about the results of MRC-funded

research, track down scientists for interviews and write briefings on research issues.”

The MSc course has provided Hazel with a range of skills that she finds useful on a daily basis. She said: “It gave me a chance to explore the ethical issues biomedical research raises. I think that in order to communicate well about research involving animals or embryonic stem cells, it helps to appreciate the range of different ethical beliefs that people hold.”



CARLO MASSARELLA (1996)
Producer and Director, *Windfall Films*

Earlier this year, Carlo was awarded an Emmy for *The Human Race*, a documentary he produced and directed, which was the third film in the Channel 4 series *DNA*. The film explores the turbulent history of the human genome project: “*The Human Race* was a definitive, inside account of the race between private and public consortiums to sequence the human genome. It featured contributions from all the scientists and politicians involved, including former president Bill Clinton,” explained Carlo.

Carlo joined Windfall Films the day after completing his Master’s and since then he has worked his way up the career ladder: “I started out as a researcher finding stories and contributors, working my way up the ladder to become a producer/director, devising and filming a wide range of series and programmes.”

Carlo is delighted to have one of the most exciting jobs around, devising new ways of presenting scientific advances to a television audience. Carlo explained how varied his job really is: “It can involve meeting or interviewing anyone from government ministers on stem cell policy to the inventor of the flying car on the future of transport. I attend scientific conferences on a wide range of subjects, to seek out new advances that might make interesting topics for films, and I spend a lot of time working with graphic artists to design simplistic but arresting ways of explaining scientific concepts to a non-scientific audience.”

Carlo is currently filming a second series of *Monster Moves* for Five. He will explain how his award winning documentary *The Human Race* was made, during his lecture for the Alumni Reunion 2006 on Saturday 16 September. For more information visit www.imperial.ac.uk/alumni/reunions.



CERI LEIGH (1994)
Design and Installation Manager,
Natural History Museum

Ceri always aspired to work for the Natural History Museum and undertook her MSc as a mature student, while working there.

She is responsible for a team of 15 people in the area of exhibition design and installation, covering both two and three-dimensional exhibitions. Ceri commented: “My team works on new temporary exhibitions, alongside a project manager, for instance on the recent *Ship – The Art of Climate Change* exhibition, which opened on 3 June 2006, and the upkeep of the permanent galleries.”

As well as having responsibility for the exhibitions themselves, Ceri looks after other visual aspects of the museum. She explained: “We’re also just about to launch the first phase of the new wayfinding signage system across the museum, in line with

our new brand, where we’ll eventually be replacing every sign across the public areas.”

Sabiha Foster (MSc Science Communication 1994) who sadly died in December 2004, also worked at the Natural History Museum.



DR CHRIS HILEY (1999)
Head of Policy and Research,
The Prostate Cancer Charity

The Prostate Cancer Charity provides support and information for men who have been diagnosed with prostate cancer, their families and their friends, as well as funding research into the causes, prevention and treatment. Chris explained her role: “I help refine the charity’s ‘line’ and presentation on all things prostate cancer related – nurse specialists, signs and symptoms, research requirements, patient experience, ageism, sexism, gender sensitive care.”

Chris was recently interviewed for BBC Radio Four’s *the Today programme*, but being the object of media attention was not something that she had expected. “I have a lot of media contact – usually by issuing new statements through our press office but also appearing on radio and TV,” she said.

As the organisation has grown Chris has taken on a range of different roles. She explained: “Initially I worked on the helpline discussing the science of prostate cancer medicine with people, who actually have to deal with the consequences of the condition and interventions to treat it. Then I had an information writing role and three different products of the charity were successful three years in a row in being commended or highly commended in the British Medical Association Patient Information Awards.”

When asked if it was always her ambition to work in a science communication role, Chris replied: “No, but I always have done, even as sister in charge of an intensive care unit for children – explaining blood test results, respiratory physiology, radiation exposure and all manner of high tech imaging and monitoring equipment.”



NEHA OKHANDIAR (2004)
Communications Officer, Department for
Environment, Food and Rural Affairs (Defra)

As a Communications Officer at Defra, Neha has an exciting and wide-ranging role: “I act as a journalist within the organisation in order to identify the interesting science we fund and communicate this to a wider audience, which includes ministers, employees and the public. It’s an extremely varied position that involves researching and writing press releases, news stories for an internal magazine and non-technical briefings called *Defra Science Notes*, which present the latest developments in topical science areas concerning Defra.”

Neha has found the experience she gained during the course invaluable: “I do use a fair amount of science communication theory in order to convince scientists and policymakers that Defra should be doing more in terms of communicating its science.”

She continued: “On the theory side I learned about the history of science, communications, linguistics... all sorts really, and on the practical side, there were numerous opportunities in terms of making a short film and editing sound for an art project.

100 years of living science

BY ABIGAIL SMITH AND ANNE BARRETT



WHEN IMPERIAL LAUNCHES ITS CENTENARY CELEBRATIONS IN January 2007, it will be under the banner *100 years of living science*.

This slogan, neatly encapsulating Imperial's mission, is the brainwave of the College's New Media Manager, Peter Gillings. Peter responded to the call for suggestions for the Centenary strapline posted in the monthly alumni e-bulletin and alumni website, and in staff and student publications. He explains that he was searching for a phrase that sums up a century of life at the College, although he hastened to add that he hasn't actually worked here quite that long.

"You only have to glance at the list of discoveries and advances led by Imperial academics over the years to realise that science is the centre of everything we do here," he said. "And it has never been static – it is a living thing that changes and moves forward as new knowledge and tools become available."

Other staff members and alumni also submitted their Centenary logo design ideas. These were shared with a designer, who was involved in rebranding the College in 2003, and the Centenary Communications Group. After many different iterations and ideas, a special logo was adopted that emphasised the number 100 and incorporated the winning strapline.

GET INVOLVED

A comprehensive programme of Centenary events is being developed across the College and will be published in autumn 2006. College events will include a formal Centenary launch event, major building openings, a celebratory staff event in July and a series of prestigious lectures throughout the year, which will be available to view via the internet.

Above | to r: 170 Queen's Gate, the original ammeter, Queen's Tower window

ARCHIVE CORNER

In our second feature on celebrating 100 years of Imperial College, **Anne Barrett**, Archivist and Corporate Records Manager, explains the background behind some more of Imperial's traditions and heritage.

THE QUEEN'S TOWER

The Queen's Tower has a number of interesting features, amongst them its bells. Built to mark Queen Victoria's Golden Jubilee in 1887, the tower is all that remains of Imperial College's forebear, the Imperial Institute, which was established by Royal Charter for the purpose of carrying out research into the resources and raw materials of the British Empire.

The Imperial Institute was designed by T.E. Collcutt in the neo-renaissance style. The belfry contains the Alexandra peal of bells, consisting of 10 bells named after the then Princess of Wales. The bells were a gift to the Prince of Wales from Mrs Elizabeth M. Millar of Melbourne, Australia, in 1892. Each bell is separately named after members of the royal family – Queen Victoria, her three sons, her daughter-in-law, Alexandra, and her five Wales grandchildren.

During the course of a normal year, the bells will be rung on a total of nine separate occasions, including royal anniversaries and special College occasions.

The windows in the lower arches of the Queen's Tower, which date from 1890, were presented to College in memory of staff member, Professor Henry George Plimmer (1856–1918), in 1921. The figures represent Professor Plimmer's interests: art, music and literature.

At the time of their donation, the windows were thought to have been made by Edward Burne-Jones, a member of the Pre-Raphaelite Brotherhood and designer for Morris and Co., the company Burne-Jones and William Morris founded to promote the Arts and Crafts movement. However, they are now thought to

be by an artist from the circle of Henry Holliday and to have been made by Powells of Whitefriars.

Professor Plimmer represents an early link between the histories of St Mary's Hospital Medical School and Imperial. He held a lectureship in pathology at St Mary's from 1898 to 1902 and was appointed to a new Chair of Comparative Pathology at Imperial College in 1915.

The frames were made especially for the windows by the College carpentry workshop and were installed for the St Mary's and Imperial merger exhibition in 1988. Three literary quotations appear at the bottom of the windows in German (Johann Wolfgang von Goethe, from *Loge: Symbolum*), French (Ernest Renan from *Discours de Réception à l'Académie Française*) and English (Marcus Aurelius from *Meditations, Book II*).

170 QUEEN'S GATE

Home to the Rector and venue for meetings of the College Council, 170 Queen's Gate provides a formal dining space for members of College and is also used for other College events.

Designed by Norman Shaw and completed in 1889, the house was commissioned by Frederick Anthony White, a wealthy cement manufacturer with an interest in art and architecture. The initials of the first owner and his wife are visible on the rainwater heads on the south façade and the White family crest forms part of the decoration of the front door.

Mr White was very proud of his house and issued a portfolio of photographs in the early 1890s, showing exterior and interior views. In 1925, he sold 170 to the sixth Marquess of Anglesey, who lived there until about 1938. At that time, the Imperial College Governing Body did look into acquiring the building but it was then leased to the Secretarial Appointments Bureau for 21 years. In 1947, the College acquired 170 with the assistance of the University Grants Committee, with vacant possession in 1959. The lease of the occupiers, the London College of Secretaries, was in fact extended to 1960.

It was agreed that the house should be adapted for use by the Governing Body with provision for the Rector's lodgings and other staff accommodation. The consulting architect to the College, Sir Hubert Worthington, began alterations that were continued by T.W. Sutcliffe and completed in 1962. Dame Sylvia Crowe designed the landscaping of the garden, and other alterations included moving the original southern boundary wall and some changes to minor architectural features.

170 Queen's Gate was scheduled as a building of special architectural or historic interest in 1958 and is generally accepted as an important example of domestic architecture of its period.

IMPERIAL STUDENTS FORM HOME GUARD IN WORLD WAR II

During World War II, the Joint Recruiting Board interviewed all male Imperial students for their eligibility to sign up as soldiers. The Board usually recommended, however, that 'students of scientific and technical subjects who are making satisfactory progress' had their call-up deferred for periods of 12 months at a time but they were obliged to take up part-time service in the Home Guard or a civil defence organisation.

The Home Guard, an important part of Britain's defence system during the Second World War, acted as a military reserve in training

for men involved in the reserved occupations (those essential for the war effort). In Imperial's case, this meant staff and students whose scientific knowledge and technical training were needed to keep up the supply of staff to the services and war industries.

By 1941 about 220 students had enrolled in the Second County of London (Chelsea and Kensington) Battalion of the Home Guard. The headquarters of the battalion was situated in the Huxley Building (now the Henry Cole Wing of the Victoria and Albert Museum) providing close contact with the College authorities.

The student platoons of 'C' Company were considered a special training unit supernumerary to the battalion establishment, as they left London for vacations, practical fieldwork and work experience. Most Imperial students were also only available for one or two years before graduating and entering the services or war industries. However, numbers in the Home Guard were maintained by the regular influx of new students. These factors made it difficult to use student platoons as an essential part of a defence scheme that could have been put into operation at any time. The skills learnt were valuable, however, as they were transferable to the services or other Home Guard units.

There was also an Imperial College static platoon consisting of staff and members of the College Maintenance Party and ARP (Air Raid Precaution) Unit. Training was given in the location of civil defence posts, barracks, fire hydrants, first aid and decontamination posts, electricity stations and underground stations by Dr Ellingham, who was instrumental in Imperial's defence organisation, in the Department of Chemistry.

Duties of the Home Guard included liaison with other civil defence organisations, such as the ARP posts in the battalion's area, which extended from Kensington Road, to Knightsbridge, Chelsea Embankment, part of Earl's Court and back up to Queen's Gate. Although slightly outside this area, duties extended to mounting the King's Guard at Buckingham Palace on 13 and 14 May 1944.

THE AMMETER

Extensive collaborative work in the late nineteenth century between Professors William Edward Ayrton (1847–1908) and John Perry (1850–1920) led to the development and manufacture of the ammeter, which is designed to measure the flow of electric current. In 1880, they devised the Permanent Magnet Ammeter and by 1883 they had devised a second form, the Magnifying Spring Ammeter. Differences in design between ammeters are dependent on whether it is intended to measure the direction of the current as well as its strength. The materials used will also affect the instrument's performance as it becomes part of the circuit it is intended to measure.

Having met in Japan, Ayrton and Perry were working at the City and Guilds Technical College (now part of Imperial College) when the ammeter was developed. Advances in ammeter design at the time reflected the growth in high voltage uses of electricity, advocated by Ayrton himself.

Ayrton and Perry also collaborated on many other forms of measuring electricity, as well as on the development of the electric tricycle and a surface-contact system for electric railways.

Above l to r: Bell ringers, inside 170 Queen's Gate, the Queen's Tower bells.

Welcome to the Imperial College Association pages.

We are pleased to bring you news from the alumni groups and many more individual alumni who have been making the news.

Our alumni groups, both in the UK and abroad, have been as busy as ever. On page 23, you can catch up with the Friends of Imperial College's visit to the Department of Aeronautics. Further afield, the German alumni group held a World Cup themed AGM in Munich. The story is on page 24.

There are plenty of ways that you can stay in touch with what is happening at the College; attending one of our forthcoming events is just one of them. On page 26, there is information about some of the events taking place over the next six months, including the Alumni Reunion 2006 on 16 September, at which Lord Robert Winston will be making the keynote speech.

Meanwhile, on page 28, you can read about the Industrial Design Engineering alumni who have won the Saatchi and Saatchi Award for World Changing Ideas, with their invention Concrete Canvas.

Obituaries are listed on pages 30–32 and finally, honours and awards received by alumni and staff of the College can be found on page 33. Read on to find out more...

Engineering Chapter

The Engineering Chapter is a partnership of the Faculty of Engineering, City and Guilds College Association (CGCA), Royal School of Mines Association (RSMA) and the Engineering Students' Union. It draws together their expertise and membership to provide alumni, students and staff with information, publications, events and networking opportunities.

An occupational network will be launched in October, in conjunction with Imperial's Careers Advisory Service, to support the needs of current students at the College. Students will be able to contact registered alumni for information on a variety of topics, such as what a company is really like to work for and tips on getting a position with a particular firm. If you are interested in being involved, please contact Teresa Sergot at t.sergot@imperial.ac.uk for more details about the scheme. www.imperial.ac.uk/engineering/about/alumni.

TERESA SERGOT
CHAPTER MANAGER

City and Guilds College Association

This is my last report to *Imperial Matters* as President of the CGCA. After two busy years in post, I was pleased to hand over the Presidency to Professor John Banyard at the Association's AGM on 24 May 2006. John read Civil Engineering in 1968 and recently retired as an Executive Director of Severn Trent Plc, responsible for capital programmes and the operation of the company's infrastructure. In 2005, he was awarded an OBE for services to the water industry. He brings fresh ideas to widen the availability of the Association's activities to more potential members.

The highlight of our programme this year was the prestigious Annual Dinner at the Ironmongers' Hall. A capacity attendance enjoyed the magnificent venue, excellent food and wines, and a most timely reminder from our guest speaker, Lord Ramsbotham, that vocational training is essential to us all. John Banyard's guest speaker was Professor Paul Jowitt, Vice President of the Institution of Civil Engineers, who spoke about *The role of the engineer in international development and poverty*

reduction. This was another excellent example of how engineers can contribute to improvements to the environment and society.

Other elements of our activities include the famous *Walks with a Past President*, where David Hattersley continues to find unusual parts of London to show members and their friends on various Saturdays through the year. *Imperial Engineer* goes from strength to strength under Bill McAuley's editorship, covering the interests of both CGCA and RSMA.

One date for your diary is our annual Decade Reunion taking place on Saturday 25 November 2006 at the College. This should not be confused with the Alumni Reunion arranged for all alumni of the College by the Office of Alumni and Development in September. For details of our events, visit www.cgca.org.uk or contact Teresa Sergot on +44 (0)20 7594 1184.

BARRY BROOKS
PAST PRESIDENT

Royal School of Mines Association

The Association continues to grow in strength, with increased alumni membership and participation, keeping the spirit of all that the RSM stands for alive. The outgoing President of the RSM, Leah Glass, and her team have been extremely active, not only in ensuring that tough academic strains placed upon students are balanced with an equally active and broad social calendar, but continuing to promote the RSM, its traditions and the needs of its students. Many thanks to Leah and her team.

February once again saw the RSM celebrating another splendid Bottle Match win, taking the current winning streak to 10 years. The bottle is firmly placed behind the Union Bar and one feels that it will remain in position for a good few years.

With the publication of its fourth edition, *Imperial Engineer* has now established itself as a quality publication for alumni of both the RSMA and CGCA. Many articles and news items have been provided by alumni members, which is invaluable in keeping the broad community of the RSMA intact and we welcome future submissions.

The enjoyment achieved over the past few months is tinged with sadness at the news of the death of Peter Harding earlier this year.

A truly amazing man, he defined all of the qualities of an RSM miner and RSMA member, continuing to support and attend events for the whole of his illustrious life. The student body has instigated a pewter tankard, *The Peter Harding Memorial Pot*, to be awarded to an RSM student who has made a long term outstanding contribution to all aspects of student life. The Association also plans to establish a lasting legacy to celebrate a truly unique individual.

PAUL HOLMES
HONORARY SECRETARY

Friends of Imperial College

Our year has gone from strength to strength with an increase in our membership and many more people attending our lectures and events. The publicity for our lectures in the national media has brought in a new audience to the College. We aim to stimulate interest in the College's work and the role of science in society.

Our first lecture of the year was *Mad cows, monkeys, and Chinese ducks – the birth of new epidemics* and brought in a particularly large crowd. Professor Sir Roy Anderson, Chair in Infectious Disease Epidemiology and Chief Scientific Advisor to the Ministry of Defence, presented an outstanding lecture to an enthralled audience. It gave not only historic and clinical perspectives, but also an insight into the problems facing governments in trying to second guess how large an epidemic of bird flu might be, and what action can be taken to limit its impact.

Professor Richard Hillier, Professor of Compressible Flow and Head of the Department of Aeronautics, hosted an exciting evening 'behind the scenes'. We explored the cockpit simulator used in the development of the Airbus 380 and visited the 'moving floor' wind tunnel, used by Formula One teams, currently being used to explore the effects of different surfaces on the flow of air, in particular the effects of indentations. It is perhaps counter-intuitive that a department devoted to flight should have a role in medicine but the department's research into fluid flow has led it into work on how blood and air flow in the body; an understanding crucial to the understanding of pulmonary and other diseases.

Professor Rod Smith, Chair in Mechanical Engineering, gave a forensic analysis of the sources of very large quantities of carbon dioxide being emitted by human activities and the huge challenge to reduce emissions and mitigate their effects in his lecture, *Planes, Trains and Automobiles: journeys from hell or green paths to the future?* Engineers and scientists would not be able to solve all the problems; individuals, the media and politicians all have vital roles to play.

Our final event of the academic year was a visit to the newly built Institute for Biomedical Engineering on 19 July where its Director, Professor Christofer Toumazou, talked about the development of 'bionic' ears and eyes. We are planning another exciting programme for the 2006-07 academic year. If you would like to join Friends visit our website at www.friendsofimperial.org.uk and download a membership form.

RODERICK RHYS JONES
CHAIRMAN

St Mary's Hospital Association

Why pay £20 to join the St Mary's Hospital Association, when your student loan is into five figures and you could buy a round at the bar to drown your sorrows?

We live in strange times indeed. We are forging ahead with a new 'syllabus' for postgraduate medical training (that many of us believe is doomed to fail) at the same time as introducing one of the largest changes in healthcare delivery since the inception of the NHS half a

century ago, both of which seem to be out of the direct control of grass roots clinicians and teachers.

I think there are a few very good reasons to stay optimistic though, and contrary to the above, I remain so. We could not be involved in a more worthwhile vocation. As people will always be prone to illness, we will always be needed, and it is important to take time to reflect on this, rather than getting bogged down in the histrionics of media reports. It is at times like this that we need to stick together as a profession, but this is becoming harder as organisations grow and diversify.

Not so long ago there were 12 medical schools in London. Their relative small size and close attachment to a single hospital fostered a relationship between students and senior clinicians that seems to have been lost in some areas today. Students trained in, and qualified from, a medical school and a hospital, rather than a university and an NHS Trust, and we need to get back to those sorts of values to ensure our professional futures. This comes back to my original question.

At the recent St Mary's Hospital Association AGM in April, it dawned on me just how important a remit the Association has. It supports a huge number of clubs and societies and sponsors the Student President's sabbatical year and the *ICSM Gazette*. Additionally, it now supports the Peter Richards Drama Scholarship and three hotly-contended first year prizes. The Association is an ardent supporter of the well-being of medical students and is quick to lobby against cuts to various on-site amenities, both now and in the future. We hope our alumni membership continues to flourish and grow.

MICHAEL JENKINS
HONORARY SECRETARY

Tanaka Business School

The Rt Hon. The Lord Heseltine captivated an audience of 130 alumni and students as a guest speaker on 16 February 2006. Guest lectures showcase prominent business people, politicians and community figures, providing alumni and students with an opportunity to gain insights into how these dynamic people have made their mark. Lord Heseltine recounted his successes, and mistakes, from his early beginnings as a young entrepreneur to his time as an MP. An article and video of the lecture are posted on the School's website www.imperial.ac.uk/tanaka/alumni.

The Imperial College Finance Network was launched on 9 February 2006. Around 70 alumni from all departments of Imperial College gathered at the School and networked over drinks, canapés, roulette, poker, black jack and a chocolate fountain! The Power and Energy Group also recently organised its first guest speaker events, with visits from Jeremy Leggett, CEO of Solar Century, and Reyad Fezzani, Executive Assistant to the CEO of the BP Group. If you are interested in becoming involved in the industry sector groups, contact Kate Vinall at k.vinall@imperial.ac.uk or call +44 (0)20 7594 6137.

The third gathering of the School's Alumni Advisory Board took place in April 2006. The focus of the meeting was on how to build a vibrant and strong alumni network in line with an ambitious School strategy. Board members were very positive about the School's strategy and provided excellent input for the Alumni Strategic Plan. If you have any issues that you would like to put forward to the Board, please contact Nicola Pogson at n.pogson@imperial.ac.uk or call +44 (0)20 7594 9201.

NICOLA POGSON
ALUMNI RELATIONS MANAGER

Imperial College in Victoria (Australia)

In April 2006, Imperial College in Victoria held a special dinner at Tolarno's in Melbourne for Dr Ruth Graham, Director of *EnVision 2010*, a College initiative which is looking to evolve the way the Faculty of Engineering teaches undergraduates and prepares them for future careers.

Over a few glasses of Australian wine, professors, academics and employers of new graduates discussed the best options for training Imperial College engineers, both theoretically and practically. Many solutions were explored, and it is hoped that the best will find their way back to *EnVision 2010*.

DAVID BISHOP (Electrical Engineering 1964, MSc Mechanical Engineering 1965)

Western Australia Alumni Association

The Minesmen still meet regularly on the first Friday of the month at the Celtic Club in Ord Street, West Perth, and on 2 June 2006 were even joined by our arch rivals – from Camborne School of Mines!

It is strange how the word can spread and we found three new alumni through *Imperial Matters*, Friends Reunited and while out for lunch with another group! All three attended our annual Imperial alumni function for the first time, which was organised by Ian Merker and Nick Butler. The dinner was held at the *K's Restaurant* in Northbridge on 17 June 2006, was attended by a total of 25 alumni and partners. We enjoyed a delightful meal of potato soup served with a pastry crust sealing it in, entrees of smoked salmon and green salad, followed by prawn crepes and selection of six exquisite main courses. The evening was rounded off with a choice of deserts, tea, coffee and a bottle of 1992 Coorinja Vintage Port generously supplied by Geoff Smith (MSc Civil Engineering 1969). A good evening was had by all and it was resolved not to leave it quite so long between these functions.

I try to keep the email list up to date and that is the preferred means of communication. If you have a new email address please let me know, and if you know other Imperial alumni in Western Australia who you think may not be on my list, then please forward my email address on to them: alan@dickson.com.au.

ALAN DICKSON (Mining Engineering 1968)

Cayman Islands Alumni Association

The Cayman Islands Alumni Association held its second meeting at the newly opened Ritz Carlton on Seven Mile Beach on 24 March 2006. The event was joint with King's College London, and we were somewhat outnumbered by King's lawyers and accountants, which is understandable given that the Caymans are the fifth largest financial centre in the world, attracting numerous lawyers and accountants but fewer scientists and engineers!

Our dinner was held in a private room at *Blue*, which is the Ritz's signature restaurant, with a chef from one of New York's finest restaurants. Needless to say we dined exceedingly well. Attendees



from Imperial were Stephen Price (Management 1999), Juliette Rea (Management 2004), and Christina Rowlandson (Health Management 2001), Peter Cunningham (Physics 1964) and Jonathan Roney (Biochemistry 1996). We hope to hold some action oriented events in the future, such as diving and hiking trips, as well as further social dinners.

PETER CUNNINGHAM (Physics 1964)

Imperial College Club of Germany e.V.



With only 20 days to go before the start of the football World Cup 2006 in Germany, the Imperial College Club of Germany joined in World Cup fever by holding its AGM in Munich, the opening venue of FIFA's prestigious event. Mr Steve Plater, Her Majesty's Consul General in Munich, welcomed us to our venue in the *Weisses Brauhaus* and assured us that Germany is ready for the English fans, and may the best team (in particular, England) win!

Lorenz Erdmann from the Berlin IZT warned us of the impact of pervasive computing, especially of RFID technology and Alister Clarke from the European Patent Office explained that the art of software patents is a dark one, with few possibilities of gaining copy protection. We were also joined by Dr Frank Berkshire from the Department of Mathematics at Imperial, who enthralled us with the appliance of mathematics in sports, giving us useful tips in the finer points of gambling and demonstrating that spinning a tennis racquet to win the toss can be legitimately manipulated, if the least stable axis of rotation is taken!

With good food and beer provided by the *Brauhaus*, a nightlife excursion into Schwabing, and a business tour of the Munich FIFA arena, we wished all teams in the World Cup success! For the photo gallery of Munich plus further information about future events, please visit www.iccg.net.

MIRANDA BELLCHAMBERS (Mechanical Engineering 1986)

Imperial College Alumni Association of Hong Kong

The second *Business Talk on Stock Investment Opportunity in China and Hong Kong* was held on 21 April 2006, attracting more than 20 members and guests. A technical visit to Cyberport was held on 20 May 2006, giving an excellent opportunity to see the state-of-the-art facilities and services provided in Cyberport – the strategic centre for IT development in Hong Kong. We were also delighted to organise a dinner with former Rector, Lord Oxburgh, which took place on 23 March 2006.

SIMON LAM (Mechanical Engineering 1993, MBA 2001)

Imperial College Alumni Association Malaysia

ICAAM celebrated its eleventh anniversary with a weekend of charity events, which included golf, lectures and a successful Grand Gala Dinner on 7 April 2006, attended by 400 local and foreign members, sponsors and their guests. The guest of honour was Malaysia's Prime Minister, the Rt Hon. Dato' Seri Abdullah Badawi, who gave an



after-dinner address on the goals of the current five-year ninth Malaysia Plan. The Prime Minister presented fourth term President of the Association, Dr Benen Foo, with the first Distinguished ICAAM Gold Medal for eight years of dedicated service.

Dr Foo then thanked all sponsors in particular Astro, a TV company which had pledged funding for scholarships. The funds collected to date will be distributed as bursaries to needy Malaysian students, currently studying at, or being admitted to, Imperial College.

A second session of lectures took place before a packed room of alumni and guests the next morning. Speakers included alumnus Mr Boon Hwee Koh, a distinguished regional banker and investor, who spoke off the cuff about the relevance of scientists and engineers for nation building; and Mr Alan Thomson, a Director of the Boston Consulting Group, who talked about the strategic perspectives of global oil.

To wrap up the Anniversary Weekend, a friendly golf game amongst members and guests was played on a Sunday morning in Bangi Golf Club, owned by Mr Soh C.K., a fellow member. The golfing champion was alumnus Mr Chee, and after defeating nine others, he was presented with a trophy by the Prime Minister.

DR BENEN FOO BAN NYEN (PhD DIC Mining Geology 1977)

Imperial College Alumni Association of Singapore

In February 2006, the Imperial College Alumni Association of Singapore (ICAAS) and the National Library Board (NLB) jointly organised a series of lectures attended by over 250 people. The series incorporated two lectures, a workshop and a discussions panel on the theme *Body Parts: the science of human reconstruction*. The concluding event on 23 February 2006 was graced by Mr Gan Kim Yong, Minister of State for Education and Manpower.

The lectures were based on the topic of *Stem Cells in the Regeneration of Human Musculoskeletal System* by Professor James Hui (National University Hospital) and *These Legs are Made for Walking* by Professor James Goh (National University of Singapore). The workshop on *Assistive Technologies* was conducted by Tan Chuah Hoh (Specialised Assistive Technology Centre) and Dr Guan Cuntai (Institute for Infocomm Research).

The discussion panel focused on the theme *The Making of the Six Million Dollar Man*, and was moderated by Professor Lee Eng Hin (National University of Singapore). Other members included Professor Edison Lui (Genome Institute of Singapore), Professor Lye Kin Mun (Institute for Infocomm Research), Professor Mike Raghunath (National University of Singapore), and Dr Lim Bing (Genome Institute of Singapore).

DR HING-YAN LEE (Computing 1981, MSc 1982)

Slovenia Alumni Association

During April, the Imperial Male Voice Choir held two concerts in Slovenia: in Ajdovina on 29 April 2006 and in Rogaska Slatina on 30 April 2006. The choir was invited to Slovenia by the Slovenian Male Choir Srečko Kosovel following their meeting in Cornwall in 2005. The Slovenia Alumni Association was represented by Andrej Paulin and his niece, Sabina, at the concert in Ajdovina. The concert was also attended by the British Ambassador to Slovenia, Tim Simmons. Following the concert, a very pleasant meeting was organised in the tourist village of Goce, testing domestic wines and local food.

DR ANDREJ PAULIN (PhD Materials 1967)

USA

Imperial College Alumni Association of Northern California

The Imperial College Alumni Association of Northern California's *Hike to the Pelican Inn and Back* took place on Saturday 29 April 2006. At the *Pelican*, the halfway stage, we skipped the planned game of darts, instead opting for Newcastle Brown plus fish and chips, which made us rather sluggish for the return leg, which included a surprise 2000-foot ascent! Attendees were grateful to Prudence and Howard Wise for suggesting this totally breathtaking experience!

Photos from the hike can be viewed online and there is a link from the following page: www.imperial.ac.uk/alumni/news/displayFullArticle.asp?id=462.

DR STEVE ROWE (MSc Physics 1964, PhD 1966)

Imperial College Exiles North America East

Last year, the Imperial College reunion was held at the Chateau Montebello, between Ottawa and Montreal, Canada, and was a great success. See www.fairmont.com/montebello for details of the hotel facilities. The hotel has reserved a block of rooms for this year's 32nd ICENAE reunion from 22 to 24 September, and those interested in attending should contact Harry Sewell: hlsewell@sbcglobal.net.

DR HARRY SEWELL (Physics 1967, PhD Electrical Engineering 1970)

Imperial College alumni event at the American Association of Petroleum Geologists Annual Convention

The American Association of Petroleum Geologists' Annual Convention 2006 took place from 10–12 April in Houston, Texas. Alumnus **Steve Webb (Physics 1973, PhD 1977)** was attending the convention and took the opportunity to organise a gathering for Imperial alumni. The reception, part of a wider event for alumni of other universities around the world, ended up with around 12 Imperial attendees. There was representation from alumni of varying class years and departments; from Arthur Down, who graduated in 1939 from Chemical Engineering, to current Earth Sciences staff and students. The majority were Geology and Petroleum Engineering graduates with a few engineers and physicists also.

Steve hopes to organise similar gatherings at future AAPGs and other industry meetings such as the SPE (Society of Petroleum Engineers) annual meeting, this year in San Antonio and the SEG (Society of Exploration Geophysicists) annual meeting, this year in New Orleans. Both meetings are in the autumn and further details of these alumni events will be available soon.

Vietnam Alumni Association

I would like to establish contact with Vietnamese Imperial College alumni. If you are interested in meeting up, please drop me a line at (0848) 823 6539 or email biotechnology@hcm.vnn.vn. I look forward to hearing from you!

LE MINH TUAN (MSc Petroleum Production Management 1997)

association_alumni focus
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events

Alumni events

Getting it right

At the end of 2005, in a bid to find out what kind of events alumni of Imperial College were interested in attending, the Office of Alumni and Development ran four focus groups, with alumni drawn from a variety of age groups and departments. Twenty alumni gave up their time to help us to explore this subject and provided helpful and constructive feedback about how we could improve our existing programme.

In particular, we wanted to find out if there was a desire for an annual alumni reunion. The answer to this question was a resounding 'yes' and attendees also indicated that there was a real desire for more frequent alumni events at the College. Participants came up with numerous ideas and our task now is to develop a programme that encompasses a variety of different events, which broadly fulfil the wishes expressed by the participants of our focus groups.

Getting started

The first Alumni Quiz Night was held on 15 March 2006 on the South Kensington Campus and we were pleased to welcome back over 130 alumni and their guests. Twenty-seven teams competed, also enjoying a curry supper. While the scores remained close throughout the evening, the 1996 winning University Challenge team ultimately clinched first place. We look forward to seeing you at the next Alumni Quiz Night in spring 2007. To tempt you to join us, here is some of the feedback we received:

"A really fun evening – will come again!"

"Enjoyable – got the grey matter going."

"Great atmosphere, great fun!"

What's on

As an alumnus, you can attend many events here at the College, or indeed in locations around the world. The UK and international alumni groups are a great source of events, as are the Friends of Imperial College, whose event programme is open to all.

Additionally, there are a number of events organised centrally by the College to which alumni are welcome – inaugural lectures, art exhibitions, musical performances to name but a few – and most of these are free of charge.

You can find out details about all forthcoming events open to alumni, both at the College and further afield by visiting the events calendar on the alumni website at www.imperial.ac.uk/alumni/events.

Another great way of finding out about what is coming up is through the monthly alumni e-bulletin. We can't send this to you unless we have your email address – update us online at www.imperial.ac.uk/alumni/interactive.

Here is a flavour of what's coming up over the next few months:

Alumni Reunion 2006

At our focus groups, participants suggested that reunion guests would prefer a flexible, family-friendly reunion programme enabling participants to choose which elements to attend. An ideal reunion would last for a day, with an optional social evening event to conclude proceedings. So that's what we've done.

Saturday 16 September 2006 will see the launch of an annual alumni reunion. With over 100 attendees already signed up, we are looking forward to welcoming back alumni who graduated any number of decades ago to celebrate their landmark anniversaries. The theme for the event is *Communicating Science* and the day will begin with a welcome from the Rector, followed by keynote speaker, Professor Robert Winston, who will attempt to answer the question, *Can we trust the scientists?*

After a buffet lunch, alumni can participate in more lectures or take part in museum and campus tours. The event will end with a dinner, which will provide a wonderful opportunity for alumni to catch up with old classmates and reminisce about their student days.

To book your place visit www.imperial.ac.uk/alumni/reunions or contact Heather Campbell in the Office of Alumni and Development for a paper booking form (h.campbell@imperial.ac.uk, +44 (0)20 7594 6138)

If your reunion isn't coming up for a few years but you are still interested in reuniting with your former classmates, why not give our reunion service a try? We can help you get in contact with your classmates and also give you a few pointers about how to organise your event.

Department of Chemistry Alumni Evening

On Thursday 28 September 2006 the Department of Chemistry will be opening its doors to its alumni. Professor Richard Templar, Head of Department, is looking forward to welcoming guests and enabling alumni to renew contact. Professor David Phillips will give a short talk on A.W. Hofmann, the founder of the Royal College of Chemistry, and his student there, Sir William Perkin. If you are an alumnus of the Department of Chemistry and would like to attend this event, please contact Virginia Manch in the Department of Chemistry (chemevents@imperial.ac.uk).

CGCA Decade Reunion Luncheon

Saturday 25 November 2006 is the date for this year's City and Guilds College Association Decade Reunion Luncheon which will take place in the Senior Common Room on the South Kensington Campus. A great atmosphere is guaranteed and attractions include short speeches from representatives of each decade, City and Guilds videos and appearances by Boanerges, Spanner and Bolt.

Friends of Imperial College

The Friends are working hard to put together their new programme of events for the next academic year. Look out for their new programme of events, which will include special lectures and behind the scenes visits, on the events calendar at www.imperial.ac.uk/events.

Events for supporters

If you provide philanthropic support to the College, you will be invited to an annual event for donors where you can meet fellow alumni, senior members of staff and some of the current Imperial students that your donations are helping. Our next event is in October 2006 and if you have made a donation to the College in the past 12 months, you will automatically receive an invitation.

In May 2006, the Rector hosted a lunch for alumni who were interested in finding out more about leaving a legacy to the College. Around 60 alumni and their guests attended the event at 170 Queen's Gate and because this event proved so popular, we will be organising a second legacy lunch at the end of September 2006. If you are interested in attending this, please contact Michelle Pulle in the Office of Alumni and Development (m.pulle@imperial.ac.uk, +44 (0)20 7594 6132).

focus on alumni

Second CIWEM win for Alumnus



MICHAEL BOOTH

Joanna Eyquem (née Brookes, MSc Environmental Technology 2001), an environmental scientist at Royal Haskoning, has won the 2006 CIWEM Young Members Award for her winning paper *Using fluvial geomorphology to inform integrated river basin management* by the Chartered Institution of Water and Environmental Management (CIWEM).

On winning the award, Joanna commented: "I am delighted to have won the CIWEM Young Members Award with this paper. I now aim to build on the experience through my work with Royal Haskoning and, with their support, become a chartered member of CIWEM."

Since gaining her MSc from Imperial College in 2001, Joanna has developed her career as an environmental scientist with specialist skills relating to river management, including fluvial geomorphology. This is the study of landforms associated with river channels and the processes that form them. It involves consideration of river adjustment through erosion and deposition, and the factors that influence river behaviour. Often fluvial geomorphology is viewed as a specialist subject that is not routinely considered in managing our rivers.

Joanna explained: "My paper demonstrates how fluvial geomorphology can practically be used to understand our river systems and identify ways in which we can improve management of river habitats."

This prestigious award was presented by John Edmonds, the former General Secretary of the GMB Trade Union at the CIWEM Annual Dinner. The award ceremony took place in the Drapers' Hall in London and was attended by Baroness Young, Chief Executive of the Environment Agency, members of parliament, Dame Yve Buckland, and senior figures in environmental consultancies and water companies.

This is the second occasion that Joanna's ability has been recognised by the Institution; she had previously won the CIWEM Metropolitan Branch Young Authors Paper Competition in 2005.

Racing Russian style

Richard Haldane (Electrical Engineering 1970) could not be accused of living a particularly restful life. For 34 years, he has been the owner of what is today one of the largest trout farms in the UK. In his spare time he also chairs the World Race Trust, a registered UK charity that organises unique running events around the world and whose patron is Lord Coe, Chairman of the London Organising Committee of the Olympic Games.

In 2005 Richard and the Trust embarked upon its most ambitious project to date – the Great Russian Race – a relay run from Vladivostok to St Petersburg, which took place from May to September over a period of 15 weeks. Its route began at the most south-easterly point of Russia in Vladivostok, loosely following the Trans-Siberian railway along the Russian border with China and Mongolia, through Siberia and on into Europe. Involving 60 relay teams of six members each, the race was run over 15 stages,



encompassing 11,000km in total.

Russia is the largest country on Earth, spanning two continents and 11 time zones, stretching all the way from Northern Europe to the Far Eastern Pacific coast. No mean feat, therefore, to organise a relay race across this vast and diverse nation, but this was certainly not a task that Richard shied away from. He even ran 570km of the total distance himself, including the equivalent of six half marathons and one full marathon during the final nine days.

Richard explains: "The ultimate aim of the race was to raise charitable funds for a number of international and Russian charities which specialise in the care of abandoned, orphaned and homeless children, with funds allocated to areas adjacent to the route of the race. By the end of 2005, \$332,000 had been raised and 35 grants had been allocated. It was a great success and I am now being urged to repeat the event in 2008, making it further and faster and more international."

Race organisation is not new to Richard. Prior to the Great Russian Race, the World Race Trust began life by organising a 100-strong team entry to the 1996 Athens Centenary Marathon, raising more than £400,000 for global educational charities. Four years later in 2000, the Trust raised £1,150,000 for 50 UK-based charities, when they organised the Island Race, a relay of 4,000 runners around the coast of Great Britain, in celebration of the Millennium. As he did in Russia, Richard participated as a runner in both of these events.

Richard's dedication and enthusiasm was acknowledged in January 2006 when he was awarded an MBE in the New Year Honours in



recognition of his charitable services to disadvantaged children in Russia.

World Race Trust website:
www.theworldrace.com



ANNA ZOLOTINA

focus on alumni

Tenth award for Concrete Canvas

Industrial Engineering Design alumni, Will Crawford and Peter Brewin, have won the Saatchi and Saatchi Award for World Changing Ideas 2005 for their invention, Concrete Canvas. The prize is worth \$100,000, in prize money and consultancy services from Saatchi and Saatchi.

Concrete Canvas is a rapidly deployable hardened shelter that requires only water and air for construction. The shelter is delivered as a sealed plastic sack, which contains a cement impregnated fabric. Filling the sack with water hydrates the cement cloth, the sack is then cut to form the groundsheet of the structure and a chemical pack activated to release a controlled volume of gas into the plastic inner, which inflates the structure. Within 12 hours the concrete cloth has set in the shape of the inflated plastic inner.

The primary application of Concrete Canvas is for relief organisations in disaster zones, as the hardened structures can be erected from the first day of a crisis, providing accommodation, field offices or medical clinics. Will and Peter spent a month in Uganda conducting field research, and have worked with UN agencies and non-governmental organisations, from which they have received extremely positive feedback. Potential secondary applications of the structures include the military and agriculture.

Concrete Canvas had already won an amazing nine awards, including the Deutsche Bank Pyramid Award and the Helen Hamlyn Award for Creativity. Peter explained: "A year and a half ago we were also fortunate enough to win the Imperial College New Business Challenge, which is what provided the early stage seed funds and convinced us to set up our business to take Concrete Canvas forward."

To date, the concept has been proved using 1/8th scale prototypes. Peter and Will are currently seeking funds to develop full size prototypes, which are required for field testing. Peter explained the importance of the



prize money: "It is incredibly useful at this early stage in our business. The money makes a huge difference to our fundraising for the capital required to develop Concrete Canvas to a pre-production level."

Further information about Concrete Canvas can be found at www.concretcanvas.org.uk.

Staying connected...



Bebo is among the most popular online social networking sites in the UK, and was co-founded by Imperial College alumnus, Michael Birch (Physics 1991). Members of Bebo can build networks among their friends and former classmates from school and university, sharing photographs and messages.

In the 13 months since its launch, over 24 million members around the world have registered with the site, which continues to grow at a phenomenal rate of 10 per cent a week. Michael explained Bebo's success in the UK: "Relative to the US, the less mature market in the UK provided more of a level playing field for Bebo to enter the market. Bebo is now the second largest site in Ireland, only behind Google, and the sixth largest in the UK."

Bebo was awarded the People's Voice Award for the best social networking website at the International Academy of Digital Arts and Sciences tenth annual 'Webby Awards' ceremony, which was voted for by the online community, a testament to the strength of its success.

The popularity of the site attracted a \$15 million (£8 million) investment from Benchmark Capital Europe in May 2006, which will be used to expand the team in the United States and to open a London office. There's a lot more to come from Bebo in the future, Michael's focus is on expanding the site in the UK through increasing the age demographic of Bebo's members and the frequency with which members return.

After graduating from Imperial College, Michael undertook web development and programming jobs as well as co-founding BirthdayAlarm with his brother, Paul Birch (Metallurgy and Materials 1987). Michael explained how this led to Bebo being established: "I was responsible for developing the original BirthdayAlarm website back in 2001, before we moved to the United States. BirthdayAlarm's success funded our other start-ups, which included Bebo in 2005. We started Bebo as a way to stay connected with family and friends."

You can sign up to Bebo and join other Imperial College alumni at www.bebo.com/icalumni

books

Imperial College Varsity 2006



JAMES WATCHORN

The sun shone at Harlington sports ground for the Varsity Games on 15 March 2006 as around 200 students ventured out to support their teams: the Imperial Medicals (Medics) and Imperial College Union (Imperial). They weren't disappointed – the day provided some excellent competitive sport of a high standard.

The games included a wide variety of sports: outdoors, teams of both genders played each other at rugby, football and hockey and, for the first time, mixed lacrosse was added to the day's programme. Back at South Kensington, indoor sports were introduced to the Varsity programme, with mixed water polo, badminton, netball and basketball teams all doing battle in the new sports centre, *Ethos*.

The day provided highs and lows for all with the Medics prevailing in the netball and the rugby and Imperial outshining their Medical counterparts in the basketball, water polo, lacrosse and badminton. The hockey and the football proved more evenly matched, with the teams taking two games each in the former, and Imperial beating the Medics in men's seconds to claim a narrow overall victory in the football.

A month earlier the annual showdown between the two men's first rugby teams in the J.P.R. Williams Cup had taken place. The thrilling, hard fought contest again attracted over a thousand spectators to Richmond Athletic Association Ground with a great mix of students, staff and guests. Everybody contributed to a competitive and vocal atmosphere, including three streakers!

The match kicked off at 19.00 and with no scoring for the first 20 minutes the deadlock was eventually broken when the Medics heavy weight pack went ahead with a pushover try. The first half ended with Medics leading.

After a period of sustained pressure early in the second half, Imperial brought the score back to 12-12. Later in the game, the Medics demonstrated their superior fitness as they slowly ground the Imperial boys down despite the strong interplay from Imperial's backs, especially wing Achunike Ejikeme. Medic, Cameron Sullivan, scored the final try and the Medics emerged victorious for the fourth year running with the final score at 22-12.

Sir Richard Sykes, Rector of Imperial College, presented player medals and J.P.R. Williams presented the winner's trophy to the Medics captain, James Logan. Man of the Match was awarded to Medic, Peter O'Neil.

Village by the Ford

Gordon Channer (DIC Civil Engineering 1964)
Cornish Books

Village by the Ford is the first in a series of five books about a family and their three children who sell everything they possess to buy a wild Cornish valley. They live beside a stream in a tiny caravan in a humorous tale based on the Channer family's own true story of escape from life in the city. Other books in the series are *House by the Stream*, *Wheel on the Hayle*, *A Buzzard to Lunch* and *Follow that Caravan*.

The New Physics for the 21st Century

Edited by Gordon Fraser (Physics 1964, PhD 1967)
Cambridge University Press

This anthology of 19 self-contained contributions by leading authorities illustrates the depth and breadth of modern physics. It explores the new scientific insights which have led to dramatic reappraisals of the world around us, and new developments that continue to make significant impacts on our lifestyle. Written in an accessible style, the chapters will appeal to scientists from all disciplines and covers, amongst other subjects, astrophysics, particles, superstrings and nanoscience.

Dr Gordon Fraser has followed a career in technical journalism and as a freelance writer. He is the author of several books, and also worked at CERN for over 25 years, where he was the editor of the *Cern Courier*.

Worldwide Travels of a Common Man

Jeremy Price (Materials 1974)
Published by Jeremy Price through www.lulu.com

This is an illustrated account of a global journey of more than a million miles through the world's major continents over a period of 30 years. It is more than just a travel guide, focusing on historical events such as the Cold War and the decline of communism and how events have affected people's lives. The book chronicles the diversity of people, culture and scenery to provide the reader with a rich appreciation of world geography in every continent.

Biological Wastewater Treatment in Warm Climate Regions

Marcos von Sperling (PhD Civil and Environmental Engineering 1990) and Carlos Augusto de Lemos Chernicharo
IWA Publishing

This book presents a thorough overview of the theory and practice of wastewater treatment. All major wastewater treatment processes are covered by full and interlinked design by examples which are built up throughout the book. As well as being used as an academic course book, the book can also be used as a reference for practising professionals, such as engineers, biologists, chemists and environmental scientists, acting in consulting companies, water authorities and environmental agencies.

Dr Marcos von Sperling is currently a Senior Lecturer in the Department of Sanitary and Environmental Engineering at the Federal University of Minas Gerais, Brazil.

Correction: The academic details of Peter Riley (author of *Nuclear Waste: Law, Policy and Pragmatism*, page 29, issue 27) should have read Peter Riley (Electrical Engineering 1958).

obituaries

MR MALCOLM E. ARNOLD (Physics 1979, MSc Computing 1980)

Malcolm Arnold worked for Logica and Nokia Telecommunications and was respected by all who knew him. There was always a welcoming smile and a word of encouragement; truly a gentle man. His wife Fiona, son Daniel, daughter Rosie, family, friends and colleagues were devastated by his sudden death in September 2005.

Provided by Fiona Arnold

MR JACK S. BAXTER (Wye College 1952)

Jack Baxter was a Horticulture Advisory Officer with the Ministry of Agriculture and then a Lecturer at Cheshire College of Agriculture. In retirement, he studied geology and anthropology at Keele University and enjoyed walking with my mother. He was an inspiration to all who knew him, and a much loved father and husband. He is greatly missed.

Provided by Janet O'Connor

PROFESSOR ALAN G. BRICKNELL (Chemistry 1934)

Upon graduation, Alan Bricknell joined the Asiatic Petroleum Company and, subsequently, the Royal Roads Military College (RRMC) in Canada. He obtained MSc and PhD degrees at the University of Saskatchewan where he was later appointed Dean of Science and Engineering. Alan was awarded an honorary DMilSci degree by the RRMC. He spent his leisure hours sailing. He is survived by one daughter.

Provided by Margaret Bricknell

DR (FREDERICK) PETER CAPPS (St Mary's Hospital Medical School 1956)

After house jobs, Peter joined a Royal Navy survey vessel in the South Pacific. On rejoining civilian medicine, he trained in paediatrics at Great Ormond Street, Ibadan, St Mary's, Boston and Birmingham before being appointed consultant to the Shrewsbury Hospitals in 1969. Peter's interests included gardening, collecting early Coalport china and the Royal Naval Volunteer Reserve. He is survived by his widow and oldest son.

Provided by Terence West (St Mary's Hospital Medical School 1964)

MR JOHN D. CHADWICK (Mechanical Engineering 1957, 1961)

At Imperial, John made friends who remained close to him throughout his life, and he filled their lives with fun, laughter and friendship. John was courageous. He spent a year in Russia at the height of the Cold War and the experience changed the way he lived his life. He remained a passionate fan of, and friend to, Imperial until he passed away much before his time. His smile is sorely missed by his wife, Sue, his children, stepchildren and grandchildren.

Provided by Susan Chadwick

LIEUTENANT COLONEL GORDON H.J. CLAISSE (Mechanical Engineering 1936)

Gordon Claisse had a distinguished war career; he entered the Territorial Army and was mobilised as a Private Fitter in the Royal Electrical and Mechanical Engineers Regiment. He spent 21 years at Gillette, followed by 10 years at Greenlands Administrative Staff College. Gordon died peacefully on 28 November 2005. He leaves a widow, Bunty, and three children, Ann, Michael and Peter.

Provided by Michael Claisse

DR (NORMAN) ANDREW CROOK (PhD Physics 1984)

Andrew Crook was an internationally renowned scientist at the National Centre for Atmospheric Research in Colorado. He was also an elite runner.

At 41, Andrew ran a five-kilometre race in 15:00.90, placing him 12th internationally among runners over 40. Andrew died on 11 February 2006. He is survived by his partner, Carol.

Source: The Denver Post

MR (DAVID) KEITH DUCKWORTH, OBE (Mechanical Engineering 1957)

Keith Duckworth, co-founder of Cosworth Engineering, was known for his exceptional design skills and insight into engineering. He designed the DFV engine, which powered the Lotus 49 to victory on its first outing, setting new standards in Formula One. Keith died on 18 December 2005. Much loved husband of Gill, father of Tricia and Roger, and stepfather to Amber and Tina. He will be remembered not only as an engineering genius but also as a wonderful person.

Provided by Gill Duckworth

EMERTIUS PROFESSOR FRANK F. EVISON, OBE (PhD Physics 1950)

As Director of the Geophysics Division of the Department of Scientific and Industrial Research and Chairman of the Institute of Geophysics, Frank Evison was an international authority on geophysics. He is survived by three children and seven grandchildren.

Source: VicNews, Victoria University

DR GEOFFREY J.C. FROHNSDORFF (PhD Chemistry 1959)

After serving in the RAF, Geoffrey went to the US on a Fulbright Scholarship, where he joined the Bureau of Standards. In 1982 he was awarded the Department of Commerce's Silver Medal for 'the development of a building materials program that has improved standards, test methods and concrete technology worldwide'. Geoffrey married Helen Keen in 1956 and is survived by three children and their respective families, two brothers and a sister.

Provided by Raymond Frohnsdorff (Chemistry 1944)

DR MARTIN R. GALLEY (PhD Chemical Engineering 1964)

Martin Galley was employed by Atomic Energy of Canada for most of his working career. He had a passionate interest in British steam trains. Martin and Joan built their dream home in British Columbia and enjoyed hiking, cross-country skiing and exploring the Okanagan Valley. In January 2004, Martin collapsed while skiing with Joan. He died doing what he loved with the one he loved.

Provided by Joan Galley

MR (CLIFFORD) GREG GREGORY (Physics 1949)

Greg took a post as a lecturer at Middlesex Hospital, followed by the role of Senior Physicist at Mount Vernon Hospital. Greg became Deputy Chief Scientific Officer for the Department of Health and Social Security, subsequently becoming Chief Scientific Officer in 1979. He died on 25 February 2006, aged 81.

Provided by Tom Gomersall (Physics 1946)

DR FRANK R.F. HARDY (PhD Chemistry 1958)

Frank looked back with great affection on his studies at Imperial and his postdoctoral fellowship at the National Research Council in Ottawa. They were the basis of his subsequent career as a Research Chemist. Frank died in November 2005, and is survived by a wife and three sons.

Provided by Frances Hardy

DR (GARNET) HENRY M. HEMSTED, MBE (St Mary's Hospital Medical School 1936)

Henry joined the Royal Medical Corps in 1940, serving in hospital ships. Later, he was a General Practitioner in Torquay, and local British Medical Association Secretary for many years. Henry was interested in meteorology. He was a part-time ticket inspector on the Dart Valley Railway until the age of 92. He leaves a wife, Mary.

Provided by John Hemsted

DR JOHN P. HOLLINGS (DIC Civil Engineering 1953)

John Hollings was a pioneer of earthquake engineering. His company, Beca Carter Hollings and Ferner, is New Zealand's largest consulting engineering company. John was a highly innovative, meticulous man who encouraged talented younger staff members. He was recognised with an honorary doctorate from the University of Canterbury.

Source: The Press

MR DOUGLAS W. JAMES (Chemistry 1946)

Douglas was proud of his many achievements gained through his long service to the community. He was Leader of Epping District Council and elected Town Mayor of Great Dunmow. He was proud of being an 'old boy' of Imperial College and wore his tie and blazer with much pride.

Provided by Carol James

DR STUART S. LAWSON (PhD Electrical Engineering 1975)

Students and colleagues at the University of Warwick appreciated Stuart's teaching, supervision and research. His sincerity and kindness have long been acknowledged. It came as a terrible shock when he died suddenly on 23 October 2005. Stuart and I became close spiritually during his illness and continue to be so. Stuart, you are in our hearts and minds. With love as always.

Provided by Christine Lawson

PROFESSOR KLAUS J. LEWIN (Westminster Medical School 1959)

Klaus Lewin made an enormous impact in gastrointestinal, liver and pancreatic pathology. He was a leader in his field, a true gentleman, giving of his many talents willingly and unstintingly. Klaus passed away on 25 October 2005, surrounded by the mountains and ocean that were so important to him. He is greatly missed by his wife, Patricia, three children and five grandchildren.

Provided by Patricia Lewin

MR CHRISTOPHER LLOYD, OBE (Wye College 1950)

Christopher Lloyd set up a nursery for unusual plants at his manor house, Great Dixter, before becoming a writer and developing the estate's garden. Christopher wrote for *Country Life* and was the author of many horticulture books. He died on 27 January 2006.

Source: The Sunday Times

MR JOHN J. LOW (Electrical Engineering 1942)

Following graduation, John Low was assigned to the Admiralty. After WWII, he went to work at a research establishment, SERL Baldock, working on LCDs and LEDs. He leaves behind a wife, Vicky, son Andrew, daughter-in-law Eleanor, and grandchildren Rosemary and Richard. And so we leave John safe in the arms of his maker and redeemer. Thanks be to God.

Provided by Andy Low

DR FRANK MAY (PhD Geology 1959)

Frank May applied to the British Geological Survey, and was appointed to the Highland Unit in Edinburgh. He spent his career mapping the Scottish Highlands and the Shetland Islands on behalf of the Survey. Frank was a dedicated geologist who enjoyed the mountains and was enured to adverse weather conditions and difficult terrain. He is sorely missed. Frank is survived by his wife, Annette, his children, Linda, Gavin and Lucy, and one grandchild.

Provided by Anthony Barber (PhD Geology 1959)

MR LESLIE F. MOORE (Mechanical Engineering 1952)

Leslie joined Fraser and Chalmers engineering works and posts at the British Shipbuilding Research Association and J. and E. Hall followed. He was known amongst friends and colleagues for his love of good food and wine and his encouragement of young people to join the engineering profession. Leslie is survived by his wife, Doris, and son, Peter.

Provided by Peter Moore

DR GRANT D. MOSSOP (PhD Geology 1973)

Grant Mossop joined the Alberta Geological Survey and was soon made Survey Head. In 1991 he became Director of the Calgary Division of the Geological Survey of Canada. He led with openness and fairness. Grant had a passion for all sports, mountains and music. He died on 7 October 2005. He is survived by wife, Ruth, three children and a granddaughter.

Source: The Globe and Mail

DR GEOFFREY L. PRICE (PhD Chemical Engineering 1970)

Following three years of employment at ICI, Geoffrey obtained a Research Fellowship in the Department of Liberal Studies in Science at the University of Manchester, later moving to the Department of Theology, where he became a Senior Lecturer. Geoffrey enjoyed travelling, particularly to eastern Europe. He died on 6 November 2005. He is survived by wife, Mavis, three children and three grandchildren.

Provided by Mavis Price

PROFESSOR UMBERTO RATTI (MSc Electrical Engineering 1966)

Umberto Ratti was a Full Professor and Chair of Advanced Electrical Engineering at the University of Rome 'La Sapienza'. He undertook postdoctoral positions and research at universities in Rome, Colorado and Missouri. He was First Scientific Counsellor for the Italian embassies in Washington DC and Tokyo. He always remembered with great nostalgia, the years spent at Imperial College.

Provided by Gabriele Ratti (Management 1996) and his family

DR DENIS W. ROBERTSON, JP (St Mary's Hospital Medical School 1950)

Denis developed a large practice among local dental surgeons. He was appointed an Authorised Medical Examiner for the Civil Aviation Authority and a Clinical Assistant at Northampton General Hospital. Becoming a Magistrate in 1968, he was made Chairman of the Northampton Bench in 1993. He leaves Marjorie, to whom he was happily married for 55 years, and two daughters.

Provided by Marjorie Robertson

DR MICHAEL G. ROYSTON (Chemical Engineering 1953, PhD 1956)

After a short stint at the Royal Aircraft Establishment, Michael worked in the food processing and brewing industry. He later joined the Battelle Memorial Institute in Geneva. He was a fun-loving man, an active Quaker and very concerned for others. He leaves behind his wife, three children, eight grandchildren and innumerable friends. Michael is sadly missed.

Provided by Erica Royston

DR CHARLES SEELEY (St Mary's Hospital Medical School 1930)

Charles Seeley had a distinguished career in public health medicine; he joined the Ministry of Health, and was later a Regional Medical Officer and Liaison Officer to the Council of Europe and the World Health Organisation. Former students, colleagues and doctors remained close friends throughout his retirement. His other interests were his family, to whom he was utterly devoted, opera and foreign travel.

Provided by Hugh Seeley

DR DAVID S. SHARP (St Mary's Hospital Medical School 1966)

In 1979, David Sharp was appointed Consultant at North Manchester General Hospital, a post he held until he retired in 1999. He also served on the Council at the Royal College of Obstetricians and Gynaecologists. David died on 6 September 2005.

Provided by Margaret Sharp

association_obituaries

MR RONALD SIMONS (Physics 1960)

Ron Simons worked for Hilger and Watts and EMI, culminating in his role as Chief Engineering Design Manager at Evershed and Vignoles. He later retrained as a secondary school teacher, providing stimulating and inspiring teaching to many young people. Ron gave a lot of time to voluntary work. He travelled widely, enjoyed hill walking and the company of his family and friends. He will be greatly missed by Wendy, children Jon and Liane, and all those who knew him.

Provided by Wendy Simons

PROFESSOR EMERITUS DAVID TABOR (Physics 1935)

David was known for his pioneering work in the science of friction and lubrication. His research career began at the Council for Scientific and Industrial Research and he later set up the Physics and Chemistry of Surfaces Group at the University of Cambridge. He will be remembered for his kindness and feel for ethical values, grounded in the ideals of Judaism. He died on 26 November 2005 and is survived by his wife, Hannah, and two sons.

Source: The Times

DR (JOHN) IAN G. TAYLOR (St Mary's Hospital Medical School 1941)

Consultant Orthopaedic Surgeon (retired) at Norfolk and Norwich Hospital.

Provided by Fodhla Taylor

MR IAN D. TELFORD (MSc DIC Civil Engineering 1995)

Much missed by Andrea, Christian and Tristan.

Provided by Andrea Morley

MR HAYDN THOMPSON (Chemical Engineering 1954)

Haydn Thompson worked in various industries around the world, but was always employed as an engineer. He loved solving puzzles, and engineering allowed him the opportunity to be paid to do just that. In January 2005, Haydn Thompson died suddenly, aged 72.

Provided by Richard Thompson

DR DAVID TRAIN (Chemical Engineering 1949, PhD 1955)

David Train joined the Royal Army Medical Corps, where he received the Military Cross for saving lives after he led a team to evacuate stranded casualties. David was a Visiting Professor at the University of Wisconsin before becoming a partner in Cremer and Warner.

Provided by Peter Train

MR DAVID C. WILKINS (Civil Engineering 1962)

David joined Demolition and Construction, later becoming a site agent. At the time of his death, he was a Chief Estimator for Skanska Group. David was a member of the London Welsh Male Voice Choir and performed with them at the Royal Albert Hall. He was popular, respected by all and well-known for his problem-solving and improvisational skills. David will be sadly missed by his family and friends.

Provided by Matthew Wilkins

MR ALAN A. WOODFIELD (Aeronautics 1959)

Alan's career began in 1959 at the Royal Aircraft Establishment, with high-speed flight research on the Fairey Aviation FD2 slender delta aircraft. He formulated a wind shear model allowing revised safe-flying techniques to be taught and practised in airline training simulators. He was awarded the RAeS Wakefield Gold Medal for contributions to aviation safety. Alan is survived by his wife and daughter.

Provided by Janice Woodfield

Also sadly deceased

MS DINA ADESOJI MSc Civil Engineering 1982

DR DESMOND W.R. ASHBY Westminster Medical School 1959

DR HENRY BADER PhD Chemistry 1948

MR IAN BAKER Mechanical Engineering 1988

DR PETER S. BARDELL PhD History of Technology 1989

DR H.B. BARKER St Mary's Hospital Medical School 1931

MR JOHN L. BENBOW Mathematics 1964, DIC Electrical Engineering 1967

MR JOHN M. BRIDGES Materials 1961

DR CHRISTOPHER D. BURBRIDGE Chemistry 1965, PhD 1968

MR JOHN M. CHANDLER Mechanical Engineering 1938, MSc 1939

PROFESSOR PHILIP Y. CHOW DIC Civil Engineering 1954

DR J.A. CONNOR Charing Cross Hospital Medical School 1963

MR FREDERICK W. COMER Chemistry 1967

PROFESSOR EMERITUS BRIAN E. CONWAY Chemistry 1946, PhD 1949

PROFESSOR PERCIVAL G. COORAY Geology 1952, PhD 1961

MR BRUCE E. COX Wye College 1962

MR T.S. CROSBY Wye College 1955

MR ANTONY C. CROZIER DIC Civil Engineering 1955

DR ALAN T. DAVEY Westminster Medical School 1957

MR PETER M. DAVEY Wye College 1939

MR N. K. DENHAM Wye College 1925

MR WILLIAM DERMOTT Wye College 1946

MR COLIN C. DICKERSON Wye College 1964

DR JOHN DORE Botany 1951

MR DONALD M. ELLIOTT Physics 1967

PROFESSOR EMERITUS ROGER D. EVERED Mechanical Engineering 1957

MR HUGH R. FINN Wye College

MR JOHN H. FLETCHER MSc Electrical Engineering 1968

MR WILLIAM H. GARWOOD Electrical Engineering 1944

MR JOHN O. GOSS Wye College 1952

PROFESSOR (ARCHIBALD) DAVID M. GREENFIELD St Mary's Hospital Medical School 1940

MR ROBERT W. HALE Wye College 1922

MR BILLY N. HARDEN Electrical Engineering 1950

MR PETER HARDING Materials 1940, 1947

MR D.I. HARTY Wye College 1940

MR ROGER Q. HEPHERD Wye College 1948

PROFESSOR PATRICK J. HERLEY PhD Chemistry 1963

PROFESSOR DENNIS W. HILL Imperial Court Member

MR JOHN H. HOOPER Wye College 1932

DR RICHARD F. HORNSNAIL Geology 1963, DIC 1964, PhD 1967

DR MING-SAN HSIEH PhD Chemical Engineering 1937

MR CHARLES H. HUDDART Wye College 1937

DR JACK INSLEY Westminster Medical School 1955

DR JOHN G. JONES St Mary's Hospital Medical School 1943

DR T.A. KEMP St Mary's Hospital Medical School

MR JOSEPH R.L. KOTSOKOANE Wye College 1955

DR BEVAN C. LANDSEER-JONES Physics 1938, MSc 1939

MR JOHN A.C. LATHAM Honorary Fellow of Imperial College

MR F.A. LEEDS Wye College 1938

MR EDGAR W. LEWCOCK Mechanical Engineering 1945

DR ADAM (N.A.) LOCKET St Mary's Hospital Medical School 1958

MR WILLIAM J. MAIDMENT Civil Engineering 1966

MR RICHARD E. MARTIN Oil Technology 1948

MR JAMES W. McHUGO Physics 1942

PROFESSOR MALCOLM McLEAN Head of the Department of Materials 1990–2000

DR DONALD C. McNEILL St Mary's Hospital Medical School 1958

MR MARTEN C. MEIJERS Mining Engineering 1997

MR DONALD C. MILLER Mechanical Engineering 1945, DIC 1948

MR GUY M. MINTER Wye College 1939

MR CHRISTOPHER MYERS Mechanical Engineering 1951

MISS HANNA M. OKSANEN MSc Mathematics 1979

MR JULIAN F. PAGELLA MSc Geology 1969

MR PETER H. PAYNE Wye College 1951

DR R.M. PECK St Mary's Hospital Medical School 1968

MR T.R.W. POWELL Wye College 1939

DR (JAMES) ALLAN RAKESTRAW Chemistry 1953, PhD 1955

MR JOHN P. ROBERTSON Civil Engineering 1956

DR SIDNEY SACKWOOD Westminster Medical School 1954

MR MICHAEL SAFFRON Physics 1964, MSc Materials 1965

DR P.H. SANDERSON St Mary's Hospital Medical School 1942

MISS VIJITHA SAVUNDARARAJAH Computing 1991

MS FRIEDA C. SCHIMMER Botany 1924, MSc 1936

DR LEONARD P. SMITH Chemistry 1946, PhD 1947

PROFESSOR PETER R. SMITH MPhil Physics 1983

DR HENRY R. SOPER Chemistry 1938, PhD 1940

MR DAVID C. SOUL Chemistry 1940

EUR ING PETER J.W. SPEAR Civil Engineering 1957, MSc 1962

MISS JOAN A. SPENCER Botany 1951

DR A.J.M. STEVENSON St Mary's Hospital Medical School 1940

DR NEVILLE E. STIDOLPH St Mary's Hospital Medical School 1937

MR (BASIL) RAYMOND SUGG Mechanical Engineering 1943

MR JOHN G. TAIT Aeronautics 1958

DR ROBERT E. THIBAUT Electrical Engineering 1972

MR JOHN D. THOMAS Wye College 1951

MR BERNARD T.B. TOMLINSON Chemistry 1943, MSc 1948

MR COLIN TROUP Mechanical Engineering 1939

MR KENNETH H. WATERS Physics 1934, DIC 1935

DR JOHN L. WHITEMAN PhD Chemistry 1965,

Mathematics 1989

MR KENELM G. WINGFIELD DIGBY Electrical Engineering 1974

DR DAVID S. WOODING Physics 1987, PhD 1994

MR WILLIAM G. YUILL Mining Engineering 1961

honours

Birthday Honours 2006

MR AOSAF AFZAL MBE (MSc Centre for the History of Science, Technology and Medicine 1998)
Science Communication Manager, Royal Society
MBE for services to science

MISS REBECCA M. BOWER OBE ACA (Mechanical Engineering 1979)
Head of Finance, Royal Botanical Gardens at Kew
OBE for services to horticulture

MR RICHARD W. HALDANE MBE (Electrical Engineering 1970)
Chairman of the Great Russia Race
MBE for charitable services to disadvantaged children in Russia

PROFESSOR ROBERT E. MANSEL CBE (Charing Cross Hospital Medical School 1971)
Professor of Surgery, University of Cardiff
CBE for services to medicine

SIR JOHN RITBLAT (Imperial College Development Advisory Board member)
Chairman British Land Company
Knighthood for services to the arts

DR TEOMAN N. SIRRI MBE MSc LRCP MRCS (St Mary's Hospital Medical School 1981)
GP
MBE for services to healthcare and to Greek and Turkish Cypriot People in London

PROFESSOR DAVID WILSON MBE
Visiting Professor in Waste Management,
Department of Civil and Environmental Engineering,
Imperial College London
MBE for services to waste management in the UK and Europe

DR GILLIAN S. WRIGHT MBE (PhD Physics 1987)
European Principal Investigator, James Webb Space Telescope
MBE for services to science

Fellows of the Academy of Medical Sciences 2006

DR CAETANO REIS E SOUSA FMedSci (Life Sciences 1989)
Principal Scientist, Cancer Research UK, London
Research Institute

PROFESSOR ROSALIND L. SMYTH FMedSci
(Westminster Medical School 1983)
Professor of Mathematical Biology, Imperial College London

Other awards and appointments



MR BRUNO F. V. COTTA (Electrical Engineering 1992, MBA 2002)
Manager, Business Research Practice, Imperial College London
Awarded honorary title of Visiting Fellow, Tanaka Business School for his contribution to the Technology Venture Programme as part of the School's MBA



PROFESSOR BRYAN T. GRENFELL (Zoology 1976)
Professor of Biology, Pennsylvania State University, Philadelphia, USA
Named Alumni Professor in the Biological Sciences and elected a Fellow of the American Academy of Arts and Sciences

DR RODERICK I. L. GUTHRIE
Director of the Metals Processing Centre and Macdonald Professor of Metallurgy, McGill University, Quebec, Canada
One of five winners of the Killam Prizes which honour eminent Canadian scholars and scientists

PROFESSOR FRANK C. HAWTHORNE
Canada Research Chair in Crystallography and Mineralogy, University of Manitoba, Canada
Appointed Officer of the Order of Canada for services to Science

MR DESMOND F. KING (Chemical Engineering 1976)
Appointed Managing Director and Chief Executive Officer of Caltex Australia Limited

DR STEFAN J. KUKULA (PhD Aeronautics 1992)
Appointed Technical Director of Crowcon Detection Instruments

LORD MARTIN REES (Visiting Professor, Department of Physics)
Appointed President of The Royal Society on 1 December 2005

PROFESSOR DICK C. SELLEY (PhD Geology 1963)
Senior Research Fellow, Imperial College London
Awarded an Honorary DSc, Kingston University for contributions to geology in general and British geoviticulture in particular

