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**COVER PICTURE:** Construction of the main stadium for Olympics 2012. It will seat 80,000 for the Games. Roof steelwork is going up and it is expected to be complete by the year end

## Imperial ENGINEER

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COPY DEADLINE FOR THE NEXT ISSUE IS FRIDAY AUGUST 14 2009

The editorial board of *Imperial Engineer* reserves the right to edit copy for style and length.

I FIND it hard to believe my year as CGCA president is fast coming to its end! It has been thoroughly enjoyable and I think your committee has made a number of moves which will make contact with you easier and more fruitful. High on the list is the departmental societies initiative, led by my predecessor, Peter Garratt. This is aimed at linking current students with alumni, using the departmental societies as the bridge. We already have two such links in formation and are looking to provide an electronic network to facilitate these. We hope the living examples will encourage other departments to join in.

We are also looking to update contact details of our membership because we have a large number of 'dead' addresses. May I remind you, please, if you are moving on, do remember to let us know as your *Imperial Engineer* may get lost in transit if you do not.

On the social side we had a delightful Christmas lunch at 170 Queen's Gate, and a very splendid annual dinner in February at the Stationers' Hall. John Armit, chairman of the Olympic Delivery Authority, gave a fascinating after-dinner address about the work being done to prepare for that huge event - see article on pages 13-15. The weather was kind so that John and I were able to enjoy riding to the event in Bo. John also enjoyed a good look under the bonnet!

Baroness (Sue) Garden gave the vote of thanks on behalf of the guests. Sue is an old friend both for me, personally and of CGCA, so it was a great pleasure to host her at our big annual event.

Next, on May 20, is our AGM. I do hope as many of you as possible will come along to that to see me hand over to my successor, John Loughhead. I can only wish him the same level of enjoyment as I have had during my year.



Julia  
Higgins

## PRESIDENTS REPORT



Kurt  
Budge

This is my final president's piece before handing over the RSMA stewardship chair to Coen Louwarts at the AGM/Final Year BBQ on Thursday June 25. I guess no one is surprised how the last two-years have passed by so quickly. Grand plans in mid-2007 have taken longer to come to fruition and the 'to do' list remains long - especially from last year's survey.

To update you, we are making silent progress on refreshing our RSMA database, sorting out memberships, re-establishing our links with the global RSMA groups in Western Australia, RSA and Canada (more countries to follow), as well as building the London network, making RSM regalia available and producing the much awaited CD of RSM songs. Your president has made a personal action item on the last one. I can hear the cheer go up as I write!

I hope you believe that the RSMA committee is 'doing things' that make sense to you as members. We reprinted the RSMA constitution in the last *Imperial Engineer* and I can assure you that our actions are very much aligned with it. The committee strives to be 'the beating heart' of the RSM alumni network. It will only get stronger with the enthusiasm and resourcefulness of our younger committee members, and with graduates continuing to join the Association and becoming active members.

Since I last wrote, we had a terrific annual dinner in November, recorded by John Bramley on page five in this issue. A personal highlight for me was the reunion of the 1991 RSM 1st XV front-five: Tim Cotton, myself, Mark Burrridge, Paul Holmes and Dave McMillan. As many of you know, nothing changes, when you bring RSM contemporaries together - the 17 years apart melted away. This year's dinner, on November 20, is the Association's 125th. We are delighted that we shall be welcoming the rector, Sir Roy Anderson. We are aiming to attract 125 attendees, so please get in touch with your own contemporaries and join us to make it a night to remember. Teresa and Rosie in the Chapter office can help you track down alumni, if needs be.

Many of us will be feeling the effects of the economic downturn and the value of the RSM network for support, both in terms of friendship and professionally, is now more important than ever. With this in mind I would like to encourage RSM alumni to join the Royal School of Mines (RSM) Alumni Group on Linked-In (<http://www.linkedin.com/groups>) as a means for reconnecting and building the links between us. There is also a Royal School of Mines group on Facebook, but given that I have only just weakened to the Facebook phenomena, this may prove a step too far for some.

Finally, I would like to thank, on your behalf, the RSMA committee and Trust members. They volunteer their time, often juggling career, travel, family and everything else that life throws at them, to work for the interests of the RSM alumni. A special thanks also to Teresa and Rosie in the Chapter office. I reassure you that the work continues as we transition the RSMA presidency from me to Coen, and the momentum will be sustained.

## DIARY DATES

### Tuesday May 12

Imperial College alumni quiz. Details and booking on [www.imperial.co.uk/alumni/quiz](http://www.imperial.co.uk/alumni/quiz)

### Wednesday May 20

CGCA AGM & President's Evening 17:30, Read Lecture Theatre, 19:30 Chem Eng Common Room, ACE Extension

### Thursday June 25

RSMA AGM and Final Year BBQ 58 Prince's Gate. AGM 18:30, barbecue 19:00

### Saturday September 26

Imperial College Alumni Reunion, South Ken Campus. Details and booking on [www.imperial.co.uk/alumni/reunion2009](http://www.imperial.co.uk/alumni/reunion2009)

### Thursday and Friday

**October 22, 23**  
Engineering Careers Fair, Queen's Lawn Marquee

### Thursday October 22

Networking Reception, venue: tbc

### Friday November 20

RSMA 125th Annual Dinner, 19:00 for 19:30, Ballroom, Polish Club Ognisko, 55 Exhibition Road

### Saturday November 28

CGCA Decade Reunion Luncheon, 12:00 for 12:30, Polish Club Ognisko, 55 Exhibition Road. Contact David Law on 02089982701 or email David.Law@delphi.com

### Thursday December 10

CGCA Christmas Lunchtime Seminar, 170 Queen's Gate, 1200 for 12:30

See booking forms on back of address carriers for this issue or contact the Chapter office (as page two) or phone 020 7594 1184

## Bottle retained

THINGS weren't going well for RSM by the time the high-point of the annual weekend of sport, known as the Bottle Match, arrived. Having lost the 'Bottle' two years ago, after an unbroken run of 10 wins against Camborne School of Mines (CSM), it was the RSM's turn to host the 107th head-to-head.

The golf was a very close competition and the first pairs drew. For the squash, CSM dominated the competition winning all five matches. In the second half of the women's hockey, RSM looked like they could take the game but the final score was 5–0 to CSM. It was much the same for the men's hockey team who lost a couple of key players in the second half to injury and ended on a 5–0 defeat. CSM also beat RSM in the football.

The first half of the actual rugby Bottle Match was



**Adam Foley takes it round Camborne to score the RSMs first try of the match To secure a DVD of the match, send an email to [anb05@imperial.ac.uk](mailto:anb05@imperial.ac.uk). Picture Will Turner, [www.will-turner.co.uk](http://www.will-turner.co.uk)**

extremely intense, with hard tackles made from both sides. In the second half and with an audience of around 250 to entertain, the RSM team finally took the lead. Inside centre Adam Foley, breaking the line, scored a try which was quickly converted. Max Joachim ran in a second try for the RSM.

Both sides continued to make big tackles and during the final moments both sides put everything they had into

the game but RSM managed to hold on to the lead with an outstanding defence for a final score of 14–10.

RSM president Adam Baldwin says that particular thanks are due to Sammy Jones, who organised the event, and to sponsors BP. 'Without them we wouldn't have had our wonderful kit and dinner'.

For full match reports and all the results visit [www.rsmonline.co.uk/bottle](http://www.rsmonline.co.uk/bottle).

## Felix scoops media awards

IMPERIAL'S *Felix* was declared student newspaper of the year category at this year's *Guardian* Student Media Awards. The College's *I.Science* magazine was runner-up. The latter is edited by Jovan Nedic, this year's winner of the CGCA Holbein Memorial Award.

Tom Roberts, *Felix* editor-

in-chief, was named student journalist of the year. His prize includes a six-week work placement at *The Guardian*.

The judges said that *Felix* managed to 'clearly engage its audience, with well thought out news pieces and a quirky sense of humour that made it stand out above the rest'.

## Top researcher

THE RESEARCH Assessment Exercise (RAE), carried out in 2008, places Imperial College top among all UK universities for the greatest concentration of research rated 'world-leading and internationally excellent'.

73% of the College's staff have had their research judged as world-leading or internationally excellent (three and four star). It also has six of the UK's top-rated research areas (four star) in chemical, civil, mechanical, aeronautical and manufacturing engineering, epidemiology, history and pure mathematics.

## First woman

A DISTINGUISHED CGCA member – Dr Jean Venables – was installed last November as the 144th president of the Institution of Civil Engineers. She is the first woman to hold the office.

Jean, who received an OBE for services to flood defence in 2004, studied civil engineering from 1966–69 and from 1973 to 74. See article pages 16–17.

## Programme prepares for 2050

LARGE-SCALE use of 'green', low-carbon electricity is one technological innovation that Imperial scientists and engineers are developing in the new 'Planet 2050' programme. It will search for the radical approaches needed to achieve the large-scale global emission reductions. One element is the 'Electric Futures' project which will explore the use of low carbon electricity to meet a large part of the UK's energy needs, in particular to replace liquid fuels for ground transport and natural gas for heating buildings.

## Hidden Darwin agenda?

DARWIN'S *Sacred Cause: race, emancipation and the quest for human origins*, launched at Imperial in February as part of celebrations of Darwin's bicentenary, suggests Darwin was passionately opposed to slavery.

Although *Origin of Species* is a scientific work without any obvious social agenda, the journal of his voyage on the *Beagle* makes it clear he was horrified by the slavery he saw and that it weighed on him.

# Imperial wraps up its construction waste

IMPERIAL has signed up to the WRAP (Waste & Resources Action Programme) voluntary agreement, becoming the first university in the UK to commit to reducing the amount of construction, demolition and excavation waste it sends to landfill.

It is aiming to reuse and recycle waste materials. It is also developing guidelines for future construction projects that include working with materials that are renewable and long lasting, and designing buildings

efficiently, so that the amount of materials used is reduced and less waste is generated.

Steve Howe, director of building projects at the College, says: 'At the moment much construction waste comes from over-ordering materials and fabricating on site. With this new agreement we are now examining opportunities to fabricate off site and reduce waste by ordering smaller deliveries of materials, as well as reusing and recycling more.'

Imperial is currently spend-

ing £100 million a year on constructing new buildings and refurbishing existing buildings across the College's campuses. It plans to build similar recycling and reusing techniques into all projects in order to meet the goal of at least halving its construction waste.

Imperial is determined to cut its carbon footprint and increase the use of recycled materials, with the ultimate aim of reducing waste sent to landfill by up to 85%.

Other waste manage-

ment initiatives include a timber recovery area on the South Kensington Campus, which will reuse or convert waste timber into energy for heating.

The College will also reuse and recycle more furniture, fittings and fixtures. Some will be reused internally or offered to outside organisations.

In addition, a new general waste recycling scheme introduced in 2008 has recycled over 900 tonnes of waste such as paper and plastic over the last year.

## Traditions upheld

TRADITIONS have always been strong at CGCA's Annual Dinner. February's event in the ancient Stationers' Hall was no different.

The 150 present stood for the procession to the top table; the wine came from the CGCA's cellar, and the evening ended with a rousing Boomalaka led by CGCU president Mark Mearing-Smith. Spanner and Bolt were present throughout

Later, Jovan Nedic (who fellow diner, Gordon Dear, said looked just like the man whose name it commemorates) received the Holbein Memorial Award for uphold-

ing College traditions in sport. Bo driver Rik Smith also received a tankard

The dinner was chaired by Dame Julia Higgins, the first female president of CGCA.

Her guest John Armitt (chairman of the Olympic Delivery Committee) toasted the CGCA and Engineering Faculty. After Dame Julia had toasted the guests, Baroness Garden of Frognal, Master of the Worshipful Company of World Traders, replied, thanking those who had worked hard to make the dinner so successful.

For a report by John Armitt about engineering the Olympics, see pages 13-15.



*Rik Smith and Robert Carter pick up Julia Higgins and John Armitt to take them to the CGCA dinner.*

## Tuneful camaraderie

AN ALMOST too-crowded ballroom at the Polish Club in Exhibition Road was the venue for RSMA's Annual Dinner in November.

Alumni, staff and their student guests enjoyed an excellent meal and inspiring speeches by president Kurt Budge and his principal guest (and RSM contemporary) Mark Burrige of Cambrian

**Kurt Budge (centre) with a reunited line-up of Mark Burrige, Tim Cotton and, below, Dave McMillan and Paul Holmes**

Mining. Mark was confident that miners, metallurgists and geologists would survive the current economic downturn due to their well-known characteristics of camaraderie, perseverance and optimism.

Coen Louwarts proposed the toast to the guests to which RSMU president, Adam Baldwin responded. Adam then led a rousing and much more tuneful than usual rendition of the Mines Song. The tunefulness may well have been due to the large number of young ladies present.

**John Bramley (Min Tech 56)**



SEVEN researchers at Imperial have been awarded European Research Council (ERC) Advanced Grants, worth around £10.5m. These will fund important research across the College.

Two grants have gone to

## More funding for research

Engineering Faculty staff – Professor Sergei Kazarian and Professor Stratos Pistikopoulos, both of Chemical Engineering. Professor Kazarian is developing chemical analysis techniques

vital to the understanding of what happens to materials as they are being made or mixed together.

Professor Pistikopoulos and his team are aiming to create

new computer-based systems to calculate the most effective, safe dose of a drug or anaesthetic for an individual patient by using novel mathematical programming methods that can take account of, and control, a multitude of different parameters.

## DEVELOPMENTS AROUND THE ENGINEERING FACULTY

### Carbon capture ready plant translates into Chinese interest

A SEMINAR to launch a Chinese translation of the International Energy Agency report *CO<sub>2</sub> Capture Ready Plants*, was held in February, at the Grantham Centre for Climate Change. Organised by Jon Gibbins of the Sustainable Energy Technology Group (Mech Eng), it included presentations by Jon, Grantham Centre's Professor Sir Brian Hoskins and Adina Mosoaga of Mott MacDonald.

After brief remarks from Matthew Webb (coal campaign

leader in the Climate Change and Energy Group at the Foreign and Commonwealth Office, Sir Brian outlined the background for CO<sub>2</sub> reduction required to keep 21st century temperature increase within the manageable level of +2°C.

Since electricity generation from fossil fuels is a major contributor, it is prudent to equip new fossil fuel plants with the technology to capture and sequester CO<sub>2</sub> produced.

However, current interna-

tional agreements do not provide adequate economic incentives for power plant developers to install this technology.

As a rational interim step, Jon put forward the case for engineering and building new plants to be carbon capture ready (CCR) by ensuring that such factors as plot plan, piping layouts and control systems provide for future installation of capture equipment.

Adina then presented the findings of a Mott MacDonald

study performed on an Indian power plant project. It concluded the essential CCR modifications would only increase initial capex by 1% and would have a negligible effect on opex.

During lunch, the Chinese translation of the report was formally presented to Dr Zhongcheng Wang of the Science and Technology Division, the Chinese Embassy.

Further details of the event and the report are available at [www.captureready.com](http://www.captureready.com).

### Boring but brilliant

A BRAIN-BORING robot that can burrow its way through tissue, is being developed by Mech Eng to make keyhole surgery safer.

Dr Ferdinando Rodriguez y Baena (Mech Eng), one of the probe's creators, explained: 'It can insinuate itself into the tissue with a minimum amount of force and should be flexible enough to move along the safest possible route'.

### When the lights go out...

BRITAIN'S energy experts say the UK faces a serious risk of blackouts within a decade, since nine of the country's major coal and oil-fuelled power plants are due to close by 2015.

One of 31 experts quizzed, Dr Jon Gibbins (Mech Eng), says the UK's energy infrastructure is at an unacceptable risk of lights going out in the next seven years.

'People die when we lose electricity supply. We've had endless dithering and enquiry after enquiry for the last five years and we've got nothing built apart from a few gas plants'.

*The source of some of these articles comes from Reporter, newspaper of Imperial College, and press releases.*

## New cement soaks up carbon dioxide

IMPERIAL spinout company, Novacem, has developed a new type of cement, based on magnesium silicates that are carbon negative because it absorbs CO<sub>2</sub> and takes less energy to produce.

Novacem chief scientist Dr Nikolaos Vlasopoulos (Civil and Environmental Engineering) says the new environmentally-friendly formulation means the cement industry could change from being a 'significant emitter to a significant absorber of CO<sub>2</sub>'.

The current making of Portland cement heats limestone or clay to around 1,500°C. This processing releases 0.8 tonnes of CO<sub>2</sub> per tonne of cement. When eventually mixed with water to make concrete, each tonne of cement can absorb up to 0.4 tonnes of CO<sub>2</sub>. However, that still leaves an overall carbon footprint per tonne of 0.4 tonnes.

Novacem's cement, which has a patent pending, uses magnesium silicates which emit no CO<sub>2</sub> when heated. Its production process also runs at much lower temperatures – around 650°C.

This leads to total CO<sub>2</sub> emissions of up to 0.5 tonnes for every tonne of cement produced. The Novacem cement formula absorb far more CO<sub>2</sub> as it hardens – about 1.1 tonnes. So the overall carbon footprint is negative – the cement removes 0.6 tonnes of CO<sub>2</sub> per tonne used.

Novacem has already attracted the attention of major construction companies, such as Rio Tinto Minerals, WSP Group and Laing O'Rourke, and investors including the Carbon Trust.

The company has just started a £1.5m project, funded by the government-backed Technology Strategy Board, to build a pilot plant. If all goes well, Dr Vlasopoulos expects to have Novacem products on the market within five years.

### UK eco-towns versus EU rules

PLANS for 15 shortlisted eco-towns sites in the UK could be thrown out under European law, says William Sheate of Imperial's Centre for Environmental Policy. 'As currently proposed, the UK's eco-towns policy, including the environmental assessment needed under planning law, potentially conflicts with European law', he says.

### New analysis tracks zinc

A MAJOR breakthrough is analysing where zinc in the atmosphere comes from. It could improve pollution monitoring and regulation, according to Imperial researchers from Earth Science and Engineering.

The study's co-author, Dr Dominik Weiss says: 'We need to know where these sources of pollution are coming from because exposure to zinc pollution over a long period of time is a significant concern for the health of residents in big cities such as Sao Paulo or London.'

'Trace metals have a nasty way of bio-accumulating. They build up through the food chain with toxic consequences.'

### Magma mountains under ice add to mystery

A NEW study, led by Earth Science and Engineering researcher Dr Tina van de Flierdt, suggests the Gamburtsev Mountains, below the Antarctic, are more than

500 million years old. However, the range's high peaks are typical of relatively young mountains.

It had been suggested that the range rose up as the re-

sult of magma build-up around a theoretical volcanic hotspot. But Tina says this hypothesis of more recent peaks is hard to reconcile with their data.

# A great year

FIRSTLY, I have to say what a great year it's been. The RSM goes from strength to strength. With a fantastic influx of dedicated freshers this year we have seen record high turnouts to events and seen our clubs and societies thrive! It has been an honour to look after the RSM this year and very enjoyable – I'm certain the memories from the year will remain with me for a very long time.

Our major events are now behind us. A successful fresher's week was followed by the legendary Freshers Dinner – over 130 guests welcomed the new students to the traditions of the RSM. The Christmas Dinner generously sponsored by Rio Tinto was as successful, a more formal Black-tie affair where a number of academic teaching staff joined us students.

More recently, the 107th Bottle Match was held in London. We had over 250 people come and enjoy the day of

events which this year was generously sponsored by BP.

It brings me great joy to say that the Bottle is home yet again and is back behind the Union Bar. An intense rugby match finished 14-10 to RSM. Unfortunately the other sporting teams did not share the same success but they are already preparing for next year's competition down in Camborne where they hope to improve on this year's performance.

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by RSMU president Adam Baldwin

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All our clubs and societies have had a successful year. The De La Beche club (DLB) have done a superb job of promoting an interest in geology outside the academic arena. There have been a number of talks followed by Gooma Loomas, and two over-subscribed field trips to the Pyrenees and Lake District. With the symposium moved to early June, due to timetable



Picture Will Turner, www.will-turner.co.uk

changes in the ESE department, the DLB has assured it's a club worth being involved with. The Hockey Club has excelled this

year – increasing their membership for the second year running and the men's team coming top of their table. The RSM football team have enjoyed a great year, finishing middle of their table and reaching a record high number of members.

The newly-formed Geophys Soc has also had a good year organising several successful talks and I am sure that they will con-

tinue to grow next year. To the future...The RSM is currently holding elections for the next year committee with a large number of officer positions being contested by freshers. It is set to be a great election with the number of candidates being far greater than in previous years, I'm certain that whatever the results the new committee will continue the hard work and effort of this year's committee.

Finally, the RSM has kept up a strong relationship with RSMA and we are extremely grateful for all their generous donations.



## Sabbatical helps CGCU

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by CGCU president Mark Mearing-Smith

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into a full year sabbatical so if you would like to donate to the fund please go to [cgcu.net/sabbatical](http://cgcu.net/sabbatical) for details.

At the start of the year, we had a very busy Freshers' week. The highlight was the cotton bags covered, and full of, information that we handed out to freshers at the Freshers' fair. All 500 were handed out, there are 1000 engineering freshers! We also organised a City of London Treasure Hunt, which was hugely popular.

## Jovan chosen by his peers

CGCU has voted Links Club member Jovan Nedic (Aero), 'Sportsman of the Year' and he received the Holbein Memorial Award at the CGCA dinner.

The winner is the one judged by his or her peers to have made an outstanding con-

tribution to sport, is an active union member, socially enthusiastic and well-liked by his or her peers.

Jovan has been captain and treasurer of Guilds rugby in successive years and is editor of *Felix* during the current year. He's also

off in Hyde Park and was not noticed missing until Pease Pottage services.

This term saw the Guilds organise the Great Egg Race. Over 100 students, in groups of four, launched their planes of the Queen's Tower to see who could get their egg the furthest. The event was an outreach event so three teams from a local school also entered.

**LEFT: Mark lead the Boomalaka at the CGCA dinner.**



managing editor of *I.Science* and 'Bolt' mascot bearer.

Jovan received his award from CGCA president Julia Higgins (above).

## Decade Lunch still great

EVEN though arranged at relatively short notice, there were good turn-outs for the 2008 Decade Reunion Luncheon. The 50s yielded 26 and the 68s and 78s were well-represented too.

The Polish Club proved rather a more intimate venue than previous alternatives and the food and wines were well appreciated.

Our usual contributions from representatives of the decades proved once again that student life was fun, whatever the vintage!

This year's reunion will be on Saturday November 28 (see Diary Dates, page four).

If it's your year (*ie* you left College in a year ending in a



**Bo and 1968 alumni reunited.**

nine), come along and enjoy the day and bring your contemporaries along too!

NB This is not the event organised by the College's Office for Alumni Development.

Photos (including other Decade luncheons) are available on: <http://www.cgca.org.uk/events/decade.php>.

**David Law**

## OC Trust helps students...

### ...present papers abroad

DURING 2008, the Old Centralians' Trust helped eight postgraduate students take up opportunities to present technical papers at prestigious conferences abroad.

Four were from Civil and

Environmental Engineering; two from Bioengineering, and one each from Aeronautics and Computing. Destinations included the USA, China, Spain, Germany and Australia.

The Trust frequently encourages departments to help with funding by offering to match any contribution made.

### ...combat an African problem

THIS January, four undergraduates made a 10-day trip to Rwanda to meet local partners and identify a suitable location for a scheme to bring reliable electricity supplies to remote and poor communities.

In September, the next phase of this project, called E.quinox (*sic*), will see a solar-powered charging station – or kiosk – installed in the remote 40-household village of Minazi. Villagers will be able to lease portable batteries and low-energy lights, at reasonable cost, from the scheme. The kiosk will not only provide charging facilities for the portable batteries, but also for mobile phones, at a cost lower than that for disposable batteries.

A key aim is to install a commercial system, providing employment and an incentive

for a kiosk 'shop keeper', since earlier schemes failed due to lack of maintenance.

The E.quinox team comprises a committee of six students, supported by 20 others, mostly from EEE but also Civil Engineering and Aeronautics. Strong partnerships have been formed with Light up the World Foundation ([www.lutw.org](http://www.lutw.org)) and Global Village Energy Partnership ([www.gvepinternational.org](http://www.gvepinternational.org)), and others in the UK and Belgium. In Rwanda, E.quinox is working with bodies including the Kigali Institute of Science & Technology, 'Energy for Africa', 'Isofoton' and the Rwandan Ministry of Infrastructure.

The Old Centralians' Trust is looking forward to future collaboration with the student team, following the current success in Rwanda.

# Imperial Consultants

Sustainable futures through knowledge transfer

IMPERIAL is at the forefront in the UK of energy research and knowledge transfer. Combine these two areas through a specialist consultancy and you have the ability to contribute towards the UK economy and a sustainable future for everyone.

Imperial research covers fuel cells, low-carbon societies, oil and gas supplies, carbon capture and storage (CCS) and alternative energies such as solar and wind.

Many of these research interests reach across the traditional discipline boundaries, often incorporating scientists from engineering, physics and life science disciplines.

Industry's been getting

in on the act, too. The number of companies investing in alternative energies and considering sustainable business models is increasing.

The oil and gas giants recognise that their current business model won't last forever and that they need to invest now in a more sustainable oil and gas industry, as well as alternative energies.

### Leading the way

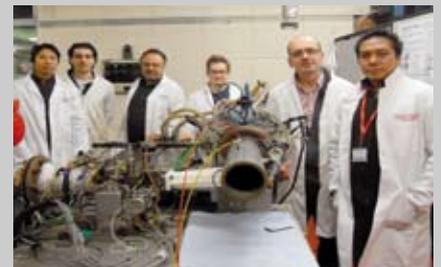
These companies are increasingly looking to knowledge within academia for solutions to these problems.

Traditionally, knowledge transfer is thought of as technology transfer, with companies such as Imperial

### Dr Ricardo Martinez-Botas...

*'I was first approached to work as a consultant because I was known in my field of research', he explains.*

*His field covers turbocharger aerodynamics*



**Dr Ricardo Martinez-Botas (second right) in the lab with his team.**

*and turbine heat transfer, working within the sustainable energy area of the thermofluids division. His consultancy work falls into three types – consulting for an industrial company; long-term consulting for a company who need him to be on-call for his advice, and one-off assessments of new inventions.*

*Often his PhD students will be able to get involved in the assessments of new inventions, expanding their knowledge of real-life applications. 'It's really exciting to be involved in something where you can make a difference. Research is often about long-term gains: consultancy is more immediate. It's great to see a company following your advice!'*

Innovations leading the way.

However, getting access to the kind of specialist knowledge academics hold is not always easy. That's why in 1990 Imperial set up Imperial Consultants.

### Expanding

It provides a way for academics to advise external organisations without having to deal with the administrative side, leaving them free to focus on the problem. It's still one of only a handful of university consulting companies in the UK, growing steadily to a turnover of over £15 million in 2007/2008.

As it's wholly owned by the College, it has the advantage of offering companies not just the specialist expertise, but also the official backing of a world-class institution.

Academics have acted as consultants in all areas of sustainability at Imperial, from advising on carbon capture and storage to climate modelling for energy firms.

Professor Nilay Shah has been consulting with Imperial Consultants since it was founded. His research is in

carbon capture and storage or focus its expertise on producing hydrogen.

Health and safety is an often overlooked part of optimising processes and contribution to the sustainability of a company. Nilay has worked with water companies to improve the health and safety processes associated with using and storing chlorine, designing a future-proof system that also considered the environmental impacts of chlorine releases.

Nilay relishes the challenges consultancy offers, and considers it a way for engineers to share their expertise for the benefit of society. 'It's a good opportunity to understand the longer-term research needs', he explains. 'Consultancy's not an end in itself.'

### Starting point

Dr Ricardo Martinez-Botas, from Mechanical Engineering says: 'Consultancy leads to meeting new people, which in turn can lead to possible research contracts'.

Another consultant who finds that consultancy contributes to rather than distracts from his research

#### CONTACT...

*Imperial Consultants if you wish to access the College's expertise and research facilities. Visit [www.imperialconsultants.co.uk](http://www.imperialconsultants.co.uk) or email [consultants@imperial.ac.uk](mailto:consultants@imperial.ac.uk).*

the area of process systems engineering, and typically he will advise a company on how they can improve their processes to become more sustainable.

His most recent work has involved advising a major industrial gases company on how it could play a role in a sustainable future economy. His report has focused on providing independent response to questions such as what capabilities it will need to expand, and whether it should move into

is Professor Goran Strbac. With alternative energies increasingly being used, the UK's electricity infrastructure needs to move forward in incorporating the new types of energy generators. Goran's work in transmission network design has led to many jobs with both government and industry.

'We tend to provide longer-term, expert advice to governments', explains Goran. 'We're currently providing a report on how the transmission networks

### Professor Nilay Shah...

An experienced consultant, having started during his PhD 20 years ago, Nilay's research in process systems engineering, is ideally suited to consultancy work.

His PhD research involved industrial collaborators,

allowing him early insight into industrial practices and problems. 'I see a lot of opportunities to apply my research to, solving industrial problems', explains Nilay. 'Our department has great industrial links and contacts. Consultancy work can lead to future research collaborations, so it's benefiting rather than taking away from my research.'

Nilay adds: 'Engineers are like medics. They ought to be engaging in professional practice, contributing to society. Consultancy is a good avenue to achieving that - all engineers should consider it!'



need to adapt to accommodate the power generated by wind farms. Most of these farms are off-shore and incorporating their fluctuating supply into the networks requires careful planning.'

Many energy companies use Goran's advice when presenting their case to the energy watchdog Ofgem for infrastructure improvements.

The UK electricity network is now over 50 years old and much of it requires replacing. Goran recently advised on the infrastructure replacement investment strategy for a major energy company. All the energy companies need to consider whether they should replace their equipment like-for-like, or look at alternatives.

Goran and his team are instrumental in advising what a sustainable network for the future would look like with alternative energy sources contributing towards power generation.

Sustainability is also a serious concern for Dr Jeremy Woods and he sees consultancy as a way of addressing those concerns:

'If you think your work's important, you need to get involved with industry. You need to be influencing companies and government.'

Jeremy's consultancy work sees him advising companies on how to reduce their greenhouse gas emissions during the production of biofuels. He's worked with government organisations and the United Nations as well as major industrial companies.

'It's a strong component of my research', explains Jeremy. 'It's sometimes easy to get lost in theoretical assessments. Working with industry provides focus and deadlines.'

### Life-changing

Researchers working as consultants, such as those whose work is described above, are helping Imperial maintain its position at the cutting-edge of energy research and knowledge transfer.

As one consultant puts it: 'What's the point of research being hidden away in universities when it could be much more relevant out in the real world, potentially changing people's lives?'

HISTORICALLY, recessions have not been good for the environment. When money is tight, concern about pollution, deforestation and the changing planet tends to slip from political and commercial agendas. In the past this has been a particular setback for the renewables industry.

You don't have to be an economist to understand why. When there is less money to spend, people stop spending money. They also turn the lights off when leaving the room. So as well as less available funding, there is less demand for energy, and less need for new energy sources. As the demand for coal drops, so does the price, and generating electricity the old way becomes cheaper. With less money around, the cheap way wins.

The pattern appears to be repeating itself in the current slowdown, with some big power companies suggesting they may have to shelve some large renewable energy projects in the UK. Amongst them is the planned London Array - potentially the world's largest offshore wind farm, planned for the Thames Estuary. Securing funding for ambitious plans such as this will be an important symbol of hope or dismay for the UK renewables industry.

### Will this recession be any different?

Perhaps. Unlike before, climate issues are now firmly on the global agenda, with a strong sense of urgency. Not only that, but optimism is growing about the opportunities that green industries offer in these difficult times. Environmental concern used to be something we would focus on when the economy was fixed. Now it is something that could fix the economy.

### Green New Deal

One route out of the global economic slump which is gathering public support is the Green New Deal - a take on President Roosevelt's route out of the 1930s' financial slump. The idea is that spending on the green industry will generate new jobs and new technology, becoming a reliable source of investment and alleviating our dependence on oil and gas. If governments want to spend their way out of this crash, the renewables industry and 'clean tech' are brimming with win-win opportunities.

President Obama is a key driver of the Green New Deal and so far has

# ECOLOGY VERSUS ECONOMY - your money or your planet?

by Barney Rhys Jones, managing director, Good Energy

managed to keep to his pre-election promises of bringing the climate centre stage. Some \$60 billion of his \$790 billion economic stimulus bill will be growing the clean energy industry. From grants, efficiency programmes, research and development to manufacturing, the US will receive a huge boost to fulfil Obama's intentions for a speedy doubling of its renewable capacity.

Governments around the world are watching intently, and some have notably already followed suit. South Korea has assigned \$24 billion of its \$36 billion recovery package to green initiatives (that's a staggering 3% of its GDP) and China one third of its \$580 billion effort. Perhaps most surprisingly

of all, in an attempt to diversify skills in preparation for life post-oil, a huge amount of investment in renewables is coming from the oil-rich nations of the Middle East.

Our own government has yet to make the same bold moves.

### EU pressure

Fortunately, and perhaps surprisingly, the EU is playing a key role. In a bold and welcome move the EU recently said the UK must produce 15% of its electricity from renewable sources by 2020 in our new Renewable Energy Target. If we HAVE to produce 15% of our electricity from renewables, we HAVE to invest serious cash over the next 11 years. This will take a seismic shift and at the moment feels daunting, but with a clear path ahead we can at least see how to start tackling the problem. The EUR500M of grants available from the EU should help to kick start things.

Recognition is growing that we need to wean ourselves off our reliance on imported fossil fuels - the 2008 spike in electricity and gas prices was as uncomfortable for the government as it was for consumers.

This pressure is bound to ignite the green energy industry in the UK and get renewables back on track.

### Other reasons to be cheerful

Global announcements of new eco-developments are still coming thick and fast. Even before Obama's stimulus package was signed, the US state of California granted planning permission for the world's largest solar farm with a huge 1300MW capacity, trumping China's announcement of investment in a 500MW farm just a month before. In India and Kenya new large-scale wind

**Barney Rhys Jones (37) took a a first class degree in civil engineering from Imperial in 1994. He's managing director of Wiltshire-based Good Energy, the only dedicated 100% renewable, UK electricity supplier with more than 14 years' experience delivering business improvement.**



**Barney was a field engineer in South East Asia with global oilfield and information services company, Schlumberger, before joining strategy consultancy Bain & Company to work in London and South Africa with a variety of clients in banking, communications and consumer goods. While at Telewest Broadband (now Virgin Media), he launched its B2B broadband offering, before returning to Bain. He moved to the environmental sector with Low Carbon Investors, managers of a £40 million fund for investment in early-stage, low-carbon businesses, where he was board chairman and non-executive director.**



**Good Energy's wind farm in Delabole, Cornwall.**

farms have secured funding, not to mention the speeding up of investment into wave power trials around the world. Of course, the sector has slowed, as any turbine or solar manufacturer will vouch for, but while other long-established industries are crumbling, the renewable sector is expected in many quarters to show resilience and remains a good bet.

### Replacing Kyoto

And then there's Copenhagen. December 2009 sees the UN summit

to replace the Kyoto protocol. Some 15,000 delegates, including major heads of state, top scientists, NGOs and economists will meet to lock heads at what is regarded as our last chance to avoid devastating climate change. This is probably the single most important meeting of our lifetimes. Bold decisions will need to be made, and solutions to be thrashed out.

Over recent years renewable energy has proved itself to be a cost effective low-carbon solution, and is bound to receive further support

at the summit. The form it takes will become clearer near the time, but investment is likely to be pledged for exciting new generation and grid technologies alongside subsidies for expanding available renewable energy capacity. Either way the renewables industry should benefit significantly at Copenhagen and many organisations, including Friends of the Earth, will be lobbying to ensure that the actions and commitments resulting from this event are binding, practical and enforceable.

### Conclusion

There is vastly more renewable energy available to be harnessed in the world than the total electricity demand today. With traditional electricity production methods contributing more than 30% of worldwide carbon emissions, it's logical to increase the output of renewables. Acting on this opportunity by generating clean, emissions-free energy will create millions of new jobs, reduce emissions and stimulate the worldwide economy. Failing to act will result in a global disaster.

That politicians are beginning to recognise this is the first step. In the meantime, the behaviour of the energy consumer remains critical in reducing demand and increasing pressure on the politicians not to allow the issue to slip off the agenda.

Visit [www.goodenergy.co.uk](http://www.goodenergy.co.uk) to find out how you can switch your home or business to 100% renewable electricity.

## How one business is using wind energy to fight recession

AS THE only dedicated, 100% renewable electricity supplier in the UK, Good Energy buys from over 500 independent generators throughout the country. St John's Wells Farm joined its ranks this year.

With banks and investors losing confidence in many conventional markets, investing in the right renewable energy projects is becoming an increasingly attractive alternative.

John Sleigh, owner of St John's Wells Farm, Aberdeenshire, believes that investment now will ensure his business remains sustainable

in the future. He says, "My family has been farming for generations...like any business, farming has to overcome problems if it is to survive and prosper. That means we need to adapt and diversify and for us, wind energy offers a great solution."

### Competitive price

John gained planning permission for his project in 2007, and his three 800kW turbines were installed this February. Good Energy offered John a 10-year contract and a competitive price for the electricity he would

generate, enabling him to raise the required funds for the wind farm.

'It's going to help us ensure that Wells Farm will stay in the Sleigh family for generations to come', he says, 'and it's helping us all to move towards a greener tomorrow'.

Good Energy will be investing several million pounds in 2009 and 2010, following the successful application to re-power its wind farm in Delabole, Cornwall, bringing in new technology and expanding power output.

## FEATURES

THOSE SOURCING deep and penetrating analysis and understanding of the current and future status of the world's petroleum engineering skill pool, or useful career advice, or technological understanding of the well engineering process, or how to rise up the corporate ladder, need read no further.

However, it's possible the odd reader may be curious how one engineer, viewing his life through the misty rose-tinted spectacles of old age, thinks he employed his professionally active years. The only thing we know about the future is that it will be different from the past, for change is the natural state of mankind. Unfortunately, the past, plus analysis of the present, is all we have to guide us into the future.

I've been very lucky in that I have managed to spend most of my career working at or near, the frontiers of oil drilling and well technology and in the company of some wonderful people. The world has given me a good living, and there's still some money left in the bank, and so it's been a successful career. I've no doubt that someone with technical competence, creative ability, and energy can make a similarly enjoyable and satisfying career by going where there are technical challenges and the money is being spent.

In 1969, an ad in *The Times* for 'Young Single Engineers' offered twice as much money as anyone else and a free trip to the USA. I stumbled headlong into the oil patch.

### *West Texas...*

...something of a culture shock. I started as a trainee mud engineer, but quickly gravitated to field engineer on a research project to optimize bit performance, using real-time control of the drilling rig on a computer (16k of memory), the size of a wardrobe with input and output via paper teleprinter tape. This was about two decades ahead of its time, but I did gain a detailed understanding of the drilling process, and its associated control systems.

I found the variety of interdependent technologies, used to drill, evaluate and complete the well, fascinating. I just enjoyed playing with the technology, and this sense of sheer enjoyment and wonder has survived throughout my whole career. I liked the people, the can-do atmosphere. I mentally joined the oil patch for life.

With Shell in 1970, I was posted to the UK for 18 months. I left nine years later after being a small (but growing) cog in the North Sea oil boom and part

# FRONTIER EXPLORER



In an article written for *The Way Ahead*, published by the Society of Petroleum Engineers, Bob Worrall looks back on his life in the oil industry

of an industry experiencing an incredible learning curve. If you were competent, you had as much responsibility as you wished to take and could handle. Only in the military would a young engineer have so many technically advanced toys to play with.

Thinking back it's hard to realise how little we knew and how primitive the technology and equipment was. As examples:

- in 1967, 17% of all wells in the USA were drilled with cable tool rigs: in the North Sea most, if not all, jack-ups were slot type and 110 feet of water was considered to be the limit:
- when it was designed, Auk was the world's deepest offshore platform in 350 feet of water: the limit for a semi-sub in summer was 500 feet of water:
- 4000HP anchor handling boats were considered to be enormous - semi-sub rig moved with four tugs all straining to get us going at 2 knots:
- all directional drilling was done with magnetic single shots and 45 degree inclination was considered the prudent limit:
- a mud motor run of 12 hours with no junk left in the hole was considered exceptional:
- all calculations were done with the Halliburton book, slide rules, log tables, mechanical calculators, and US surveying tables.

Iron roughnecks, top drives, digital wireline logging tools, steering tools,

MWD, and PDC bits were all things of the future; logs were transmitted to shore by indifferent fax machines.

I recall seeing a reservoir simulation being done with a scale model of the reservoir made of glass beads, the glycerin representing the oil being displaced by water: there were very few locally-owned companies in Aberdeen active in the technical side of oil industry: and, sadly, health and safety wasn't accorded the priority it now has.

### *Lowestoft...*

...I was a shiny new, bright green drilling engineer on platforms and jackups, with trips to Aberdeen on Air Anglia by DC-3. I believe that there were 3 semi-sub rigs in the North Sea. A later memory comes flooding back of arriving back on shore with a broken ankle, having fallen through a hole in the grating on a platform rig move. Back in the office I worked on a rather elegant study on comparing two platform rigs (one French and one American) to see which learnt fastest.

### *Aberdeen...*

...Working on and around floating rigs, on one occasion being seasick for four days on a supply vessel; learning the mysteries of anchor handling, ship stability, saturation diving, risers, new fangled heave compensators, sub-sea BOP stacks, as well as the odd bit of drilling technology.

Then I was assigned to planning and starting up the drilling on platforms in the Brent system, including all the complexities of simultaneous drilling and production, in a very crowded area. At times it seemed that we were designing the platforms as they were being built. Few of those involved in the design had been offshore.

### *London...*

...Working in a multi-disciplinary team on field development and platform design, learning a lot about other disciplines, and broadening my outlook immensely.

### *Nigeria...*

...was Bob's next workplace. Go to the Faculty website, printed on page two, to read the tale of the rest of his interesting career.

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**BOB WORRALL took a BSc (Eng) in Mech Eng in 1968, being given an ACGI. He spent a year on the ORMS course (Operations Research and Management Studies) for an MSc (Eng), also from Imperial, and received a DIC.**

# Engineering the Olympics

The process of delivering an Olympic games has been described as the single largest logistical challenge a country faces outside war. Here John Armitt, chairman of the Olympic Delivery Committee, (and principal speaker at the CGCA Annual Dinner) describes the engineering making it happen.

FOR THE last 40 years as a civil engineer. I have had the pleasure of creating roads, railways, power stations, airports, bridges, hospitals, commercial buildings and housing from Sizewell to Singapore, London to Lagos.

Today I am involved delivering the infrastructure for the 2012 Olympics in East London. On the single 600 acre site we are building tunnels, roads, railways, a power station, 35 bridges, housing, service spines for electricity, water, telecoms and sewage and, not least, sports stadia. Nearly every type of civil engineering, condensed into one site.

It is an £8bn expenditure, a lot, you will say 'for a month of sport!'. But for the infrastructure just listed, most of that money - 75p of every £ - is providing infrastructure for the next 100 years. Also reflect on the contribution that such a level of public investment can have on economic activity in a recession. There will be 30,000 jobs on the site alone.

The site at Stratford, bounded by four of London's poorest boroughs, is hardly green field. Occupied since the Romans who had one of their earliest settlements on the River Lee, it has been the home for 2,000 years to every type of human endeavour.

Between 2005 and 2007, 85 businesses had to be relocated and, most vociferously, a group of allotment holders and the travellers, who didn't want to!

Having free access to the site 18 months ago, the engineering work could begin. The previous occupants left a site heavily contaminated by pollutants from hydrocarbons and heavy metals to arsenic.

One of the key criteria for our work is sustainability, so to minimise landfill and off-site lorry movements, we are cleaning the contaminated soil and recycling materials from 200 demolished buildings. The result is 95% of materials recycled and 75% of the contaminated soil cleaned for reuse.

The site was criss-crossed by National Grid power lines suspended on 52 giant pylons. Today the pylons have

gone and the power cables nestle in two 6km tunnels, 30 metres below the ground - a £250m project which frees the land for redevelopment.

For thousands of years, the River Lee has been tidal, exposing mud banks through the Olympic site. Today a new lock means the water level can be controlled, ending the view of mud flats and old bicycles and creating a new leisure facility.

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**After graduating as a civil engineer, John Armitt was with Laings for 27 years, the last seven as chairman of International and Civil Engineering Divisions. From there he was chief executive of high-speed Channel Tunnel Rail Link developer Union Railways. In 1997, he went to Costain as chief executive before joining Railtrack as chief executive and then Network Rail. Mr Armitt is chairman of the Engineering and Physical Sciences Research Council, a fellow of the Royal Academy of Engineering and the Institution of Civil Engineers. He was awarded the CBE in 1996 for contributions to the rail industry and has three honorary doctorates.**




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Half a million spectators a day have to get to Stratford and half a billion pounds is being spent to upgrade Stratford station, the North London line, the DLR and West Ham station. In addition, the Jubilee line is being upgraded and a new high-speed service on the Channel Tunnel Rail Link will whisk passengers from St Pancras to Stratford in seven minutes. All these improvements essential for the Olympics, will also provide a legacy of advanced rail transport links in London.

The 35 new bridges, which cross the waterways and railways, will connect Hackney, Newham, Tower Hamlets and Walthamstow, in a way they have never known before, creating an opportunity for greater physical and social cohesion.

The sporting drama of the Olym-

pics will unfold in the various stadia. These provide the opportunity for architects and engineers to create unique sporting venues. The main Olympic stadium for the ceremonies and athletics will be the first to be specially designed to be demountable from its 80,000 Olympic spectator capacity to 25,000 afterwards, so avoiding the risk of an Olympian white elephant - the curse of many previous games. We are already erecting the roof steelwork and by the end of the year the structure will be complete.

Zaha Hadid, the internationally famous British architect, has designed the aquatics stadium. It is an iconic piece of architecture, its sweeping 160 metres-long free-form roof difficult to engineer. It will house 18,000 spectators and 3,000 post games. It is hard to believe, but London does not have an Olympic diving pool and, therefore, the two variable depth 50 metre pools and the diving pool will provide a fantastic future venue for community and top level swimmers alike.

Britain's cyclists swept the board in Beijing. 2012 provides the opportunity for a velodrome in London which will not only provide track facilities, but after the Olympics will also be a centre for BMX, road and mountain biking. In addition, there will be a demountable 12,000-seat basket ball stadium and a 7,000-seat handball stadium. Post the Games they will provide facilities for a dozen or more indoor sports. To give you an idea of scale, the handball stadium is the size of the Festival Hall on the South Bank.

Accommodation for the athletes in the Olympic village is being provided in 3,000 new flats, in 14 different blocks, designed by 12 different architects. The rate of production of 40 completed flats a week is a major challenge for the builders. The flats are being designed to BREEAM Code level 4, the highest environmental quality in London today.

Of the 600 acres, 150 will be landscaped parkland with the river flowing through the centre - a terrific opportunity to provide a new green lung for the east of London.

## FEATURES

In line with our sustainable agenda, a combined cooling and heating power station will not only provide electricity, but also cooling and heating to the village and will be able to run on 20% biomass fuel. The addition of wind turbines and photovoltaics will ensure 20% of energy used on the Olympic park is from renewable sources. Buildings are being designed to have a reduction of 50% in their CO<sub>2</sub> footprint and to use 40% less potable water.

Rail and water-bourne transport ensures we reduce road deliveries by 50%. Even so, at peak times 40 lorries an hour will be arriving at site.

Games time will see 20,000 of the world's journalists descend on London and they, with the actual organisation of the Games, will require broadcasting and communication systems of the very highest quality, challenging engineers to achieve the right balance between reliability, speed and highest quality and definition. The buildings to house them are equivalent to Canary Wharf Tower laid on its side and will provide job opportunities post Games.

In today's world a similar quality of security arrangements will be required. Even during construction we are using X-ray, biometrics and facial recognition systems.

During the Games, 3,000 tonnes of materials of all sorts from food and beverages to memorabilia and sports equipment will be shipped in and out every evening. The total process of delivering an Olympic games has been described as the single largest logistical challenge a country faces outside of war.

Any review of preparation for the Olympics would be incomplete without reference to training. It was one of our criteria that there will be a legacy of people with new skills they have obtained as a consequence of the Games. We have set ourselves a target of 2,300 people who will have new skills for life through 350 apprenticeships and other training. On site, we have established two construction skills centres. The first, a plant operator's school, has trained 300 people of whom 80% are now working on the Olympics. The second is providing training in general construction, such as concreting, drain laying, dry lining, roofing and road maintenance.

At the professional end, undergraduates from ethnic groups are being mentored to assist them into careers; others on sandwich courses are being sponsored for their site work, and post-graduates are undertaking their professional training. Particular emphasis is being put on helping unemployed into work and, at present, 9% of the

### OLYMPIC PARK OVERVIEW

- 2.5km<sup>2</sup> (246 hectares) in size, equivalent size to Hyde Park.
- 8.35km of waterways in and around Park.
- Will become one of the largest urban parks to be built in Europe for 150 years.
- 100 hectares of new parklands including new gardens stretching for half a mile sitting between the Aquatics Centre and Olympic Stadium.
- 10 rail lines will serve the Olympic Park.
- Cycling and walking routes will be enhanced.

### WORKFORCE

- Currently around 3,300.
- As the 'big build' accelerates in 2009 the workforce is expected to more than treble to a peak of 11,000 on the Olympic Park and Olympic Village in 2010.
- A total of up to 30,000 people will help build the London 2012 Olympic Park and Olympic Village over the next few years.

### CLEAN UP OF SITE

- Handed to the ODA on time, summer 2007.
- Nearly 200 buildings demolished with more than 90% of demolition materials recycled or reused.
- Over 1.5 million m<sup>2</sup> of soil – enough to fill 600 Olympic swimming pools – is being excavated, tested and cleaned of heavy industrial pollution.
- Two large remediation plants created with soil washing machines installed to wash, sieve and shake out the contamination – petrol, oil, tar and heavy metals such as arsenic and lead.
- Safe to use clean sand or gravel is retained. In some instances chemicals are added to the water to tackle particular types of contamination.
- Billions of naturally occurring microorganisms were used to help clean nearly 50,000 tonnes of soil – the bacteria, fungi and microbes completely clean this soil

workforce were previously unemployed.

Engineering is central to an Olympic games. Athletes draw on continuous engineering advances to improve their performance and, of course, as we saw in Beijing, engineering supports the opening and closing ceremonies.

Engineers are creating the infrastructure for the Games and for a lasting legacy which will regenerate a major area of East London, reduce deprivation, help social cohesion and create a new destination in London for the next 100 years. The individuals who have made it happen will not only have pride in their achievement, but will have experience and skills to enhance their lives.



## Olympic Park

without any waste being taken to landfill as part of the green, high-tech clean up.

- The microorganisms in the soil have adapted to naturally consume petroleum hydrocarbons such as petrol and diesel. Warm air, nutrients and water vapour is pumped through soil in especially constructed bioremediation beds to massively increase the numbers of harmless microorganisms and speed up this natural 'composting' process.
- 66 scientists, technicians and other specialist in on-site, high-tech lab using state-of-the-art equipment testing soil to see if it needs to be cleaned and if decontaminated soil is ready to be reused on site.

### POWERLINES PROJECT

- Work completed on time and to budget for tunnelling, cabling, and pylon removal work.

#### Tunnelling

- Two 6km tunnels built to carry power underground for the Games and legacy developments.
- Four huge 40-tonne tunnelling machines used.
- Tunnelling work completed in 424 days accounting for 85% of the UK's tunnelling for that year.
- 200,000m<sup>3</sup> of spoil created – enough to fill Wembley Stadium – the majority of which is being reused on site.
- Complex tunnelling process encountered obstacles including soil contamination, small ground movements and water ingresses.
- Tunnelling delivered on time, on budget and with an impressive health and safety record which was better than the industry average.

#### Cabling

- From June 2007 to install 200km of cabling



## – facts and figures on key venues and

installed in tunnels – enough to stretch from London to Nottingham.

- More than 9,000 brackets also installed to carry cabling along the tunnel walls together with monitoring and ventilation equipment.
- Cabling phase of project completed on schedule in May 2008, allowing testing and commissioning of the new underground equipment to begin.
- Power then switched underground this summer allowing work to remove the overhead pylons and powerlines to begin.

### Pylon removal

- 52 overhead pylons removed - 1300 tonnes of steel which will all be recycled.
- 130km of overhead wires removed.

### OLYMPIC STADIUM

- 80,000 seats during Games, 25,000 seats in legacy.
- Unique site – compact and surrounded by water on three sides, 5 major bridges will lead spectators into the site.
- The total island site covers 40 acres
- Stadium has a total floor area of 108,500m<sup>2</sup>.
- It will be 53m high – taller than Nelson's Column.
- Stadium roof covers 24,500m<sup>2</sup> – equivalent to three and a half football pitches.
- Perimeter is 860m – equivalent in length to 72 London buses.
- Over 800,000 tonnes of soil taken away to make construction Stadium platform – enough to fill the Albert Hall nine times.
- First phase of construction involved reinforcing the Stadium site by inserting 4,000 concrete piles up to 20m deep.
- Highly sustainable, containing around 10,000 tonnes of steel – the lightest Olympic Stadium to date.
- 1,300m<sup>3</sup> of concrete poured to create podium slab for concourse and concrete ter-

racing supports in place in lower bowl.

- Steel terracing supports, each weighing 35 tonnes, are being lifted into place above the podium level to hold the 55,000 seats in the upper tiers
- First 30m-long steel section of the roof compression truss has been lifted into place, taking the Stadium to almost 37m above podium level
- A 1,350 tonne super-lift crane has been assembled, in what will be the field of play, to lift each 85 tonne, 15m-high section and hold it in place while it is bolted to the top of the 27m-high roof support columns.

### AQUATICS CENTRE

- The Zaha Hadid designed Aquatics Centre is located in the south of the Olympic Park and will be the main 'Gateway into the Games', hosting swimming, diving, synchronised swimming, water polo finals and swimming for the Modern Pentathlon
- It will have a capacity of 17,500 during the Games, reducing to a maximum of 2,500 after, with the ability to add 1,000 for major events, and provide two 50m swimming pools, a diving pool and dry diving area. London does not have this at present
- Around 160,000 tonnes of soil have been dug out of what was one of the more challenging and complex areas of the Olympic Park
- Four skeletons were discovered and removed from a prehistoric settlement discovered on site
- 140,000 tonnes of clean soil has been brought from other areas of the Olympic Park ready for construction to start.
- The 160m long sweeping roof and 80m at its widest point, is an innovative 2,800 tonne steel structure with a striking and robust aluminium covering on three supports.
- The roof will be internally and externally clad with timber. The team is currently

finalising its selection of the most appropriate timber before installation in 2010.

- Over 20,000 tonnes of concrete have been poured to complete the southern roof support and on the two northern roof supports which are almost complete.
- The huge completed southern roof support is nine metre high, 28m long, over 5m wide, using 850m<sup>3</sup> of concrete

### VELOPARK

The VeloPark design includes:

- **A 6,000-seat Velodrome** to host the Olympic and Paralympic indoor track cycling events and be used by elite athletes and the local community afterwards.
- After the Games, it will include a café and other facilities and the venue design will include a 360° concourse offering fantastic views over the Olympic Park and out to the London skyline.
- Construction work is starting on the Velodrome in March 2009.
- Being built on the former West Ham tip it requires a complex network of foundations to underpin the venue – more than 900 piled foundations, sunk 26m-deep into the ground.
- The state-of-the-art track has been progressed by the international track designer Ron Webb. It requires full maintenance access beneath and additional excavation into the ground.
- **BMX circuit** – to host Olympic events in 2012 and then be reconfigured for use by cyclists of all levels of ability.
- **Road cycle circuit** – a one-mile circuit built after the Games.
- **Mountain bike course** – a 6km course with a range of mountain bike trails for riders of various abilities after the Games.

**TOP: The Aquatics Centre and (below) the Velodrome, as they will be.**



**JEAN VENABLES** – My very early involvement with the ICE was as a grateful recipient of an ICE scholarship, which made a significant difference to my budget. At Imperial, I compounded being in a minority as a woman studying engineering by continuing my interest in fencing – it was hard to muster a women’s team in foil even from all of Imperial!

On graduating in 1969, I joined the committee of ALGS (the Association of London Graduates & Students of the ICE) and soon became its chairman. I was actively involved early in a campaign to have graduates and students appointed to senior committees of the ICE. I was appointed to the education & training committee and to the founding editorial advisory board of the Institution’s magazine *New Civil Engineer*. How did you get involved?

**Paul Jowitt** – *Unlike you, I had no early contact with the ICE! My student experience was dominated more by ICU and C&GU. In fact I had a very sceptical view of the ICE – based largely on ignorance but there were other distractions! At Imperial, our paths crossed only ephemerally. Ironic*



*really, since I ended up teaching on the same MSc course that you had studied earlier! As you will know, the really great thing about masters courses is that they are a multi-way learning experience – the students bring their experiences, the academic staff bring theirs and it’s all shared and developed further for everyone’s benefit. And especially for those masters courses that attract a large proportion of overseas students. People tend to forget these days that education, learning and engineering is still very much a social process...*

**Jean Venables** – That reminds me that the Open University was founded in 1970. When I was invited to become a course tutor in 1975, they were unaware that my father-in-law had been chairman of its planning commit-

# Two journeys to one destination

A conversation between Jean Venables, president 2008-9 of the Institution of Civil Engineers, and Paul Jowitt, ICE president-elect

tee. It developed my love of sharing knowledge.

Soon after I became a chartered engineer and joined Kingston Polytechnic (later Kingston University) and greatly enjoyed teaching students of all ages and experience. I found it particularly rewarding to be involved in starting and then teaching one of the very first part-time degrees in civil engineering. Now I have an ‘extended family’ of past students around the world. It’s always great to see them again and catch up.

**Paul** – *Yes, as an academic, you don’t get to look back at the projects you’ve been involved with, things you’ve helped build, but you do get the pleasure of seeing your students graduate and develop their careers. And like good wine – and unlike most completed construction projects – they improve with age! But how did your involvement with ICE develop?*

**Jean** – ALGS was a great platform. I was elected to ICE Council first in 1975 (there was no local association in London then, so after becoming a chartered civil engineer, the only option for continued involvement was the national Council!). I’ve also been elected to the Committee of Management of the Benevolent Fund six times. But, given your initial antipathy towards ICE, how – and why – did you get involved?!

**Paul** – *Some colleagues at Imperial suggested I should get more involved with the ICE. I didn’t see the point, but a number of things started to change my mind.*

*I suppose the first was that I was asked to present a paper that had been published in the ICE proceedings (later awarded the ICE Trevitbick Prize) at an evening meeting. That was the first time I had ever entered ICE HQ at One Great George Street. The paper was essentially about risk-based asset management in the water industry. It had come about through John Banyard of Severn Trent (more recently president of CGCA). Shortly*

*afterwards I was appointed professor of civil engineering at Heriot Watt University. The question was asked at the interview – why aren’t you a member of the ICE? I told them my reasons – which were becoming increasingly thin! It was dawning on me that my position wasn’t very credible! Not for me so much, but for my students, for my department and for the profession. And it was likely to be the next head of department.*

*So I applied in 1988 to sit the professional examination at the ripe old age of 38! Scary – especially as a few of my academic colleagues were in the same room. Thankfully, we all passed. Shortly afterwards I was elected to the Edinburgh and East of Scotland Association Committee. While I was getting round to all this you’d been rather more active, but what is interesting is that by different routes we’d not only become involved in the ICE, but also had picked up the importance of civil engineering to the environment and also to what has emerged as the concept of sustainable development...*

**Jean** – Absolutely. A major connection between ICE, my husband and business partner Roger and my continuing involvement in the environment and sustainability agenda was our involvement in organising an ALGS conference on ‘Resources – Tomorrow’s Dilemma’ as far back as 1973. Afterwards, we presented our conclusions and sought ICE support for addressing the issue of over-exploitation of natural resources. We were told: ‘Everything would be all right’. But it wasn’t immediate! So it was very good later on to see the ICE form an Environment & Sustainability Committee and for Roger to be a member from 1997, and then its chairman from 2000 to 2003.

That was also the start of CEEQUAL – the pioneering assessment and awards scheme for improving sustainability in civil engineering and public realm projects. It’s supported by the ICE and other organisations. Fellow Imperial

graduate Roger led the development project and now leads the scheme management team. Through Crane Environmental, and especially through CEEQUAL, we are working to assist all those involved in civil engineering and building to reduce the adverse environmental impact of their work and improve their environmental and sustainability performance. It's very good to be part of a very positive agenda.

**Paul** - *Sustainability? Yes, Jean, civil engineering is in a pivotal position here. I wish I'd realised it sooner. As a student I was very fortunate to take Ian Munro's final year option in 'Systems' - about seeing the bigger picture and cutting across the traditional technical disciplines. My real regret is not reading Rachel Carson's Silent Spring at the time! The connections would have been obvious. My first real connection between ICE and sustainability was being asked to chair an ICE working group to establish a set of Sustainable Development Guidelines for undergraduate degree courses, which have done much to pressurise civil engineering departments to increase their coverage of sustainability issues. But I think you were already active in this area yourself with your interests in flood risk management?*

**Jean** - Yes, there are strong links between my interests in sustainable development and my involvement in flooding issues. I was invited, in 1985, by the Ministry of Agriculture, Fisheries & Food to join the Thames Water Authority Regional Land Drainage Committee (RLDC), the start of my involve-



ment in flood defence and flood risk management at a national level. The formation of the National Rivers Authority turned this into the Thames Region Flood Defence Committee. I was its chairman from 1994 to 2003. That led to my initiating the project of which I'm perhaps most proud - the Thames Estuary 2100 Project (TE2100) - a pro-active look forward at how we need to manage flood risk and flood defences in the Thames Estuary to the end of this century. It's about sustaining life and business as we know it along the Thames Estuary, whilst minimising the adverse impacts on the rest of the environment.

The results of the eight years of intensive study, under the leadership of project manager Sarah Lavery (also an Imperial alumna) will be presented by the Environment Agency at a conference in April. There has been much data collection and innovations during the study.

My major focus now is on flood risk management, water level management and drainage, and influencing policy in these vital areas of life. As well as my role on the TE2100, I am chief executive of the Association of Drainage Authorities, whose members are at the sharp-end of the day-to-day management of water levels, as well as flood risk management. ADA has a major influencing role and this summer we anticipate being busy responding to the forthcoming Floods and Water Bill, being developed in response to the Pitt Review of the summer 2007 floods in the UK.

**Paul** - *So you've managed to mix academia with practical engineering... Jean - But so have you!*

**Paul** - *That's true. I was chairman and CEO of Tynemarch Systems, a spinout company I'd established with Imperial colleagues on systems solutions for the water industry. Later at Heriot Watt, I was appointed CEO of the Scottish Institute of Sustainable Technology Ltd - a joint venture between Heriot Watt and MWH. Like you, I engaged with organisations vital to society. In your case it was drainage issues across the length and breadth of England and Wales: in my case as a non-executive director of Scottish Water and as a regional board member of the Scottish Environment Protection Agency. Both were rewarding, but helping Scottish Water become one of the UK's leading water utilities is something I'm very proud of - not least because it has a Scottish Parliament obligation to have regard for sustainable development - a duty not imposed on the privatised water utilities in England and Wales!*

(continued on page 22)

Jean Venables studied civil engineering at Imperial from 1966-69 and 1973-74 for her MSc in public health engineering. She is currently a visiting professor and a member of the Court at Imperial.

Paul Jowitt (with Jean, right) was at Imperial 1969-72 and from 72-74 for his PhD. From 1975-86, he was a lecturer in civil engineering systems and then water resources engineering.

Jean Venables became the Institution of Civil Engineers' 144th president last November. Her presidential visits have included New Zealand, China, Scotland, Wales and N Ireland with all the English ICE regions to come as well as Canada, Ireland, Hungary and India. The theme developed at her well-attended presidential address was the importance and urgency of adaptation to climate change and the need for mitigation especially in reducing emissions.

Paul Jowitt is to succeed Jean as ICE president on November 3. His theme will pick up the sustainable infrastructure theme with international development and young engineers.



## The start...

Jean and Paul have had such very different career paths but have a common destination - something neither ever expected. Jean believes very firmly in the concept of the president and vice-presidents forming a strong presidential team and is delighted to have Paul as the senior vice president in that team.

## Something brewing

EDDIE GADD graduated from the RSM in 1991 with a BSc in mining engineering. His engineering skills and enthusiasm for beer and brewing – shaped in part by his years at the RSM – have led Eddie to establish a successful brewery, and carve out a happy life for himself and his family on England's south coast.

'I came to the RSM sort of by accident', says Eddie. 'My best mate from school was taking the mining engineering course and his father – who was also my tutor – suggested it might be a good option for me. After a very short time at the RSM I knew I was in the right place.'

'Apart from mining, our lecturers taught us how to bond as a team, how to give presentations, and other worldly skills. A few of my peers are still in the mining industry and some of them have made lots of money striking out on their own.'

Several of Eddie's pewter tankards still sit behind the Union Bar – garnered for, among other accolades, the Chaps award, being hockey player of the year and RSM union vice president. 'I have really fond memories of the RSM, of bar nights and rugby songs. That mining camaraderie is something special.'

Since graduating, Eddie hasn't had many opportunities to enjoy a pint in one of his tankards. 'Running my own business for six years, I've not been in much of a position to get to RSM events. Hopefully, now the brewery is more established, there might be more opportunity'.

After graduating, Eddie spent five



Eddie in his Ramsgate shop.

# From mining to mash and must

Two RSM alumni have turned their enthusiasm for quality wine and beer into flourishing businesses and have built lives in idyllic parts of the world. Here, brewery owner Eddie Gadd and vineyard owner Philip Togni talk to *Imperial Engineer* about how they did it.

years working on the Channel Tunnel and then for London Underground. At one point, between contracts on the Jubilee Line extension, I took some work at a small brewery in West London.'

### Learning curve

He really got into it and turned down more work with London Underground to stay at the brewery. 'Eventually we were bought out by Allied Domecq and I worked in retail for them in London, Paris and Holland. It taught me a lot about the business, and when they made me redundant, it gave me the money I needed to set up on my own.'

In late 2000, Eddie moved back to the UK with his wife and daughter, and started building his own brewing business in Kent. Three years ago he acquired an industrial property near Broadstairs and established the Ramsgate Brewery.

The brewery now produces a range of regular beers as well as seasonal varieties, all sold under the 'Gadds' brand. The business is still small in terms of employees – two full-time and five part-time staff, which goes up to eight in the summer. 'In fact we don't have enough people which is a good sign', says Eddie.

'I used to live by the maxim: "Never employ your friends" – but now I only employ my friends! It's hard work, but we have good fun and everyone takes a pride in the business. We're driven by the right things.'

'The work-life balance is getting easier as we grow. I live nearby, by the sea. I've got a nice lifestyle, nice kids, a nice house and a nice business. I sometimes don't know how I ended up with all of this.'

According to Eddie, business is going really well. The Ramsgate Brewery is the only independent brewer in East Kent, and has become well-established in the local area, selling beer to pubs in a 20 mile radius. A shop at the brewery sells beer by the bottle, and some varie-

ties are also stocked in Kent branches of Waitrose. 'Sometimes our beers go further afield, when wholesalers pick them up for beer festivals', says Eddie. 'Festivals are great fun; we can sell some more unusual beers there that we don't sell to pubs'.

Brewing is an industry in flux. Eddie explains: 'It's not the traditional business it used to be. Brewers are constantly looking for new methods and flavours, and innovation can bring great success. I enjoy being experimental. For instance, I'm currently storing some beer in casks from a whisky distillery in Islay. I've found a way to make that peaty, smoky flavour work really well with the beer.'

Eddie's time at the RSM has certainly helped him build up his successful business. As well as helping him with his appreciation of beer, the engineering skills have been essential. 'My engineering knowledge helped get me through the early years, and keep the plant running.'

### Major expansion?

The Ramsgate Brewery is a thriving business. 'We're growing at 30%', said Eddie. 'We can't really go any faster. I've been adding capacity incrementally but this year we'll have to decide whether we need a major capacity expansion.'

'The growth is being driven by consumers', says Eddie. 'A number of positive factors have come together at the same time. We're now better at what we do than when we started, and we're improving all the time. Our name is becoming more widely known in the area and, at the same time, consumer interest in locally-sourced food and drink is increasing. People want to support their local producers. It's a trend that's working really well for us.'

Although customers may be sacrificing some treats in these challenging economic times, Eddie's story seems to suggest that having a quality pint in

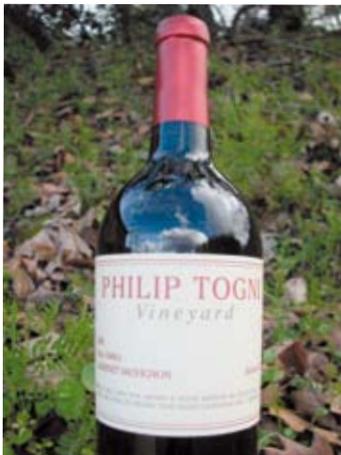
the local pub, or a few bottles of beer at home, are small luxuries that are not only surviving, but are flourishing.

## *A vine time*

In 1944, the war was coming to an end when the Royal Navy's recruitment office told young Philip Togni he'd be more use to the country if he went to university. 'So I joined a class of just three men studying oil technology at the RSM', says Philip.

In 1947, Philip was called up and became a troop commander of 26 Assault Squadron RE. He went back to the RSM, graduated in 1950 and worked for Shell in the Netherlands. Then, having learned Spanish in the army, Philip got a job for an oil company in Colombia.

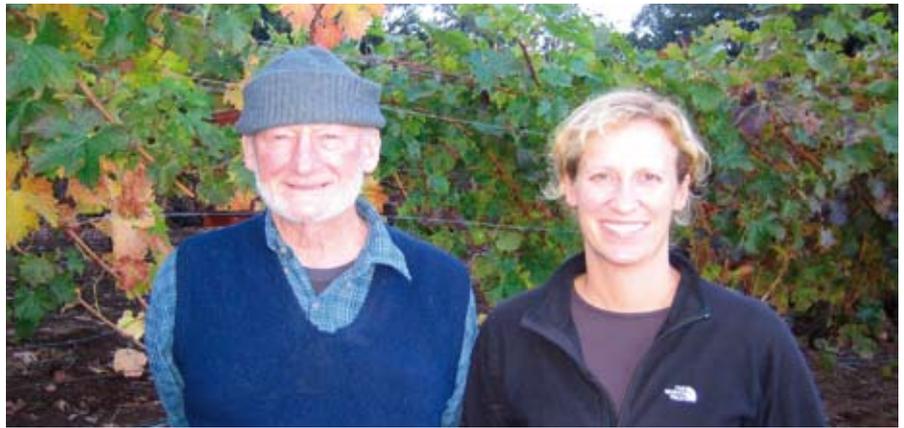
'After a while, everyone started getting out of oil and I thought I'd try and move into some sort of agriculture. When I was breezing around Spain on leave, I'd seen grapes growing, and decided that was what I wanted to do. I realised that when you grow grapes, you get to drink the very best wine.'



'So I went to France for three years, studied at the National School of Agriculture in Montpellier and got a diploma in oenology from the University of Bordeaux. I also spent six months in Algeria learning about large-scale farming.'

Equipped with his new skills, Philip found a job in a Chilean vineyard. 'Then I got an offer of work from a winery in California. I always thought I would go back to Chile, but then I met a Swedish girl. We got married and I've been in California now for 50 years.'

'I gained experience working for various Californian producers. I made all my mistakes with other people's wine, before I got my own vineyard!'



Philip has had his vineyard in the Napa Valley for 25 years. It's very much a family affair, co-owned with his wife Birgitta and daughter Lisa. The family do most of the work, with just two other employees. Philip is now in his 80s, but still very active in all aspects of the business. Eventually, though, Lisa - now the designated winemaker of the Togni vineyard - will take over.

### Varietal

The Tognis have intentionally kept the vineyard small - 10 and a half acres - and produce a single variety of wine - a cabernet. The slopes of the vineyard, 2,000 feet above sea level, grow predominantly cabernet sauvignon grapes, plus some cabernet franc, and petit verdot and merlot.

Philip explains the formula for good wine: 'Quality comes from the combination of soil, climate, and grape variety. You create your wine within those limits, then make the tweaks yourself.'

When Lisa takes the helm, the vineyard will continue just as it is. 'Lisa agrees with us so closely about how the business should be run, that if someone offered her grapes from the other side of the fence, she wouldn't take them.'

'There's safety in being small, especially in the current economic climate. Any wine that we don't sell, we can lay down and its quality will keep improving for around 25 years.'

There doesn't seem to be any need to change the current business model, which has made the vineyard - in Philip's words - 'rather successful'. Each bottle retails for US\$90, giving a turnover of US\$1-1.5 million a year.

The wine has been rated highly by renowned wine critic Robert Parker and has been enjoyed by ambassadors and countesses, as well as RSM alumni from Philip's graduating year. 'I sent some over to our class's 50 year anniversary celebrations in 2000 when I couldn't make it over to London myself.'

In general, though, the UK is not a big market for Philip's higher end Californian wine. Around 10 to 15 % of the vineyard's output is exported and there has been a recent shift in demand to Asia, including China, Japan and Singapore. Philip's domestic market covers mail order and restaurant customers in 35 US states. His wine is on the menu at The French Laundry, down the road in Yountville, California, which has three Michelin stars and is regarded as one of the best restaurants in the world.

Philip's home is the house he built in the middle of the vineyard. 'I always wanted to create a chateau like I'd seen in the Medoc', he says. Looking down on the valley, the lemon trees, and the oak forest, his dream seems to have become reality.

### True spirit

Talking to Eddie and Philip, you get the impression that their passion, clarity of vision and hard graft have brought them both exactly where they want to be in life. They may work in fields of industry far removed from their RSM training, but in what they do, there's an application of science, a sense of fun and adventure, and an appreciation of the things that really matter, which seems to capture the very spirit of the Royal School of Mines.

**By Penny Trussell (Geol 99)**

**EDDIE GADD, 01843 868453, eddie@ramsgatebrewery.co.uk or www.ramsgatebrewery.co.uk (under construction)**

**PHILIP TOGNI +1 707 963 3731, www.philipognivineyard.com. Try Philip on his wife's email birgitta-togni@yahoo.com.**

**Anyone in the UK interested in tasting Philip's recent vintages could order a bottle or two from The Vineyard Cellars, Hungerford, Berkshire (01488 681313).**

**BOOK REVIEW**

*Prescription for the Planet* by Tom Blees

IMPERIAL Engineer readers may be divergent in their early thinking about a problem, but in the end are convergent in their answer. They normally use proven techniques and established practice to achieve a technological end – an output technically safe and financially sound. Reputations depend on it.

This is where someone like Tom Blees comes in like a breath of fresh air. He is a numerate environmentalist. He has dreamed up a new energy world summarised by two acronyms; IFR and GREAT. As subsidiary considerations he introduces boron/oxygen as a recyclable automotive fuel system and plasma conversion technology for solid waste disposal. He weaves a new energy paradigm around these ideas and sets out to substantiate it.

IFR stands for Integral Fast (Nuclear) Reactor, which some people might recognise as a breeder reactor. The UK established and operated an experimental reactor of this type from the 1950s, at Dounreay in northern Scotland. Tom sketches the history of this technology and its fairly recent shelving in the US, apparently for political/ military reasons.

GREAT stands for Global Rescue Energy Alliance Trust. It is an international version of the French AREVA organisation that oversees all aspects of national nuclear power, from mining to disposal.

Regarding boron/oxygen: extremely fine (nano) particles of boron are reactive (because of very high specific surface). This semi-metal also has the advantage of being more concentrated in energy terms than hydrocarbon fuels (available energy per unit volume and mass). Combust it in oxygen and the boron is potentially recyclable.

Regarding plasma conversion: when processed in a plasma, very interesting and useful things happen to solid wastes and landfill, yielding a valuable feedstock and inert residues. It also deals with many toxins.

Add a dose of terraforming and a dash of conspiracy theory and you have a challenging read. Find out more on [www.prescriptionforthep-planet.com](http://www.prescriptionforthep-planet.com)

**Bill Bradford (Min Tech 57)**

Three alumni write about what they have done and are doing now...

# Exciting yet demanding times

WHEN I graduated from Mech Eng with a BSc(Eng) in 1977, I joined Ford Motor Company in product development, working first on trucks and then on cars including a spell in Detroit from 1995-1998. (I was the project manager responsible for the last two Ford Transit programmes and the first Ford Focus).

My last job at Ford was as chief engineer responsible for alignment of Engineering Standards and product verification methods across all the Ford Motor Companies. That included Ford, Jaguar, Land Rover, Volvo, Aston Martin and Mazda.

Last May, I was elected chairman of the Institution of Mechanical Engineers' automobile division and have been using my year as chairman to work on my area of interest - low carbon vehicles.

I have been presenting a series of lectures around the country which explore potential technical solutions to reduce the CO<sub>2</sub> emissions from vehicles and the time frame for likely introduction of these technologies.

My lecture is available as a video and as downloadable slides from the IMechE website at [www.imeche.org/industries/auto/webcasts.htm](http://www.imeche.org/industries/auto/webcasts.htm)

I took early retirement in early 2006 to pursue my interests in education and low emission vehicles. Since then I have been running a final year design course in automotive engineering at Loughborough University; given a couple of guest lectures at Imperial in Mech Eng, and am a visiting professor at the University of Hertfordshire, department of aerospace, automotive and design engineering, plus consultancy in low carbon technology.

In October 2008, I was appointed Royal Academy of Engineering visiting professor for innovation and design with the objective to develop innovative teaching methods.

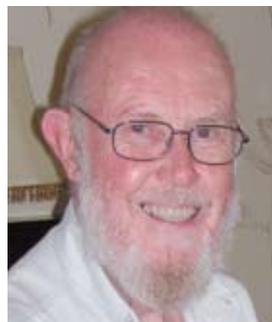
My work has led me to the conclusion that this is one of the most exciting and demanding times engineers have ever faced and, despite the current financially challenging climate, this is a period of great opportunity for new engineering graduates. I foresee exciting job opportunities in the area of automotive engineering and carbon dioxide reductions for many years to come.

**Richard Folkson (Mech Eng 77)**  
01277 374389  
[RFOLKSON@aol.com](mailto:RFOLKSON@aol.com)

## Caustic comment on 60s!

BACK IN the 60s when I was process engineer at a caustic/chlorine plant belonging to Alcan, I came across an article suggesting that mercury cells could be de-polarized by the addition of surface active agents. The plant had 122 cells where mercury ran along the bottom of a trough containing a stream of brine, in which square carbon anodes were suspended. Chlorine was formed on the bottom of these anodes.

I think the cell room drew 28,000 amps and was fed at 600 volts or thereabouts. Anyway, with the boss's permission I got a gallon of orvus paste from P&G and fed a tiny stream of a



dilute solution into the brine. The results were fantastic!

There was panic in the rectifier department, which hadn't been notified, when the cell room voltage fell 60 or 100 volts, and there must have been a gush of chlorine to handle. After things had

settled down, the Company was able to make the same amount of caustic soda as before but at considerable energy savings - 60,000 watts saved 24/7. But, as they generated their own electricity, I suppose it was just so much more water over the dam.

**Tony Bridgens (above, Min Tech 62)**  
[tonybridgens@sympatico.ca](mailto:tonybridgens@sympatico.ca)

OLD FRIENDSHIPS can be resurrected and sustained in many different ways, often spanning many decades depending on circumstances. This tale has its origin in the early 60s when three 'young lags', Mike Anson (Civil Eng), John Gordon (Biochemistry) and Norman Loch (Mech Eng) were post grads at IC.

Our friendship originated from the IC Golf Club, centred around Highgate GC, where IC students could play on Wednesdays and Saturdays for a £1 a year (no failing banks then!).

In the early days, when we carried our clubs, it was a bit of a trek from South Ken, especially when we had to negotiate the mammoth escalator at Highgate station, surely one of the longest in the underground.

Most of the time we played a threesome but on one occasion we were joined by another postgrad - a red-haired Scot called Hunter Smith, who was dressed in a kilt, tweed jacket, sporran, *etc* and heading for a wedding (not his). Much to our amusement (and others), he proceeded to play a round giving rise to the vision of Rob Roy wielding not a battleaxe but a set of Dunlop irons.

### Speculation

No prizes were awarded for guessing the topic of gossip by the Highgate regulars in the bar that day.

One incident occurred around 1962 (I think), when Highgate clubhouse was burned to the ground destroying everything, including members' equipment. News of this event had not reached the leafy environs of South Ken when one day John and I decided to head for 18 holes.

Imagine our surprise, not to say

## Golf at Highgate and beyond



**Slightly older lags at Lancaster Golf Club in 2007. From left: John Gordon, Mike Anson and Norman Loch.**

dismay, when plan B had to be implemented as we trudged across piles of charred and twisted golf clubs resembling a Salvadore Dali painting. Sadly for John, his clubs had been left in a locker and were now part of the Dali collection - except his putter which had miraculously escaped the inferno!

Not surprisingly, our friendship was put on hold for some 40-odd years as in the post IC era, our careers took hold. Mike headed for Australia and Hong Kong while John was attracted to the colder climes of Russia. Being the least adventurous, I kept the home fires burning by remaining in the UK.

Correspondence was maintained over the years via Christmas cards with both Mike and John retaining homes in Lancaster and Hitchin respectively.

For some odd reason, around 2004, our separate activities converged, resulting in our meeting again in the UK with the catalyst being the love of golf.

Since both Mike and John normally

returned to the UK from abroad about three to four times per annum, we all agreed to resurrect our golf by meeting in early May for two days' amusement, with each person acting as host.

### Dad's Army

To date, we have played at Lancaster, Knebworth, Letchworth and the wild courses of Scotland, earning the sobriquet of *Last of the Summer Wine* or more appropriately *Dad's Army*.

This year the venue will be in East Lothian, home of such famed courses as Muirfield and Gullane though, to play at the former, a letter of introduction from the Lord Chancellor will probably be required!

After a lapse of 40 odd years, it's wonderful to have such reunions and despite some creaking joints and shorter backswings, hopefully magic pills for the elderly, plus the application of WD-40 will keep us going! **Norman Loch**  
**Mech Eng PhD 60, Nnorloch@aol.com**

## CAN YOU HELP?

***We're looking for advertising for Imperial Engineer, especially from companies which provide our members' employment base and would benefit from exposure in something read by people now working in their diverse industries.***

***Can YOU, our readers, approach your own organisations? The editors will be happy to follow up your lead if needed.***

***Please forward all ideas and contact details to the Chapter office (details page two).***

## Two journeys

(continued from page 17)

**(Paul)** – *I suppose the main driver in my career has been to inculcate my students – and others – with an understanding of key engineering principles and, perhaps more importantly, the role that engineering plays in underpinning civilisation itself...*

*In many ways, that was a key spin-off of my ICE 6th International Brunel Lecture – ‘Engineering Civilisation from the Shadows’ – delivered to over 4,000 people in 16 countries – and addressing the inter-linked issues of climate change and international development. It was a tremendous experience, one I know you shared when Roger delivered the third Brunel Lecture which focused the engineer’s mind on sustainable development. I was very pleased to be asked by Imperial to contribute to their 2007 examination of engineering education and sustainability – ‘Global sustainability – the future for engineering education’. What’s your involvement in engineering education these days?*

**Jean Venables** – As well as my many years at Kingston Polytechnic and being a course tutor for the Open University, I’ve delivered a wide range of professional development short courses. I am now honoured to be a visiting professor, not only at Imperial, but also at Southampton and Strathclyde, and look forward to contributing to teaching at Imperial in the coming years. The interactions with young engineers have been a continuing passion in my career...

**Paul Jowitt** – *Both of us have extensive university experience but whatever a ‘traditional academic’ is, I’m not sure either of us fits that mould! But it’s been the foundation of my career, and a platform from which we’ve been able to promote the value of civil engineering to the wider public good – in the UK and internationally. That’s the value of civil engineering – it has a moral imperative that extends into succeeding generations. We both have grandchildren but our concerns for the future extend beyond them. As you said, we’re both part of an ICE presidential team. It’s only by working together that we’ll address the issues of the future. And that extends beyond the ICE – not least to Imperial’s engineers of all disciplines and graduates in others, too. It’s an interdisciplinary world.*

## Alumni share their views...Alumni share their views...

Last issue’s centre spread, on the causes of climate change, caused quite a number of members to put pen to paper. Their views are published here...

## A reply to Lord Monckton

FROM PHILIP COGHLAN (Min Res 82)

LORD MONCKTON misrepresents the IPCC and some important aspects of climate science. He begins by quoting work by S-I Akasofu, 2008, claiming any global temperature rise is due to recovery from low sunspot activity in the 17th century, known as the Maunder Minimum. However, Akasofu has said openly he is not a climatologist, and for that reason does not want his climate notes published in a professional journal. Monckton has relied on a questionable climate source, while ignoring solar research by Prof Haigh and other peer-reviewed work such as Lockwood and Frohlich, 2007.

Monckton’s comment, that the sun was ‘more active in the past 70 years than in the previous 11,400’ means little as the actual changes in solar radiation since the 17th century have been too small to be of great significance (Frohlich et al, 2006).

Monckton then makes the extraordinary claim that CO<sub>2</sub> cannot be blamed as it ‘occupies only one-ten-thousandth more in the atmosphere today than in 1750’. This represents an increase of roughly one third, most of which has been of anthropogenic origin.

The greenhouse effect of atmospheric CO<sub>2</sub> is undisputed, and its concentration is rising at an accelerating rate. It is perverse of Monckton to dismiss the increase of CO<sub>2</sub> in this way.

Monckton also uses the widespread claim that there has been ‘no global warming since 1998’, and that ‘for seven years temperatures have fallen’. 1998 was exceptionally hot and, year-by-year, climate variability has no necessary significance for overall trends. In fact, underlying trends shows that the period 2001-2007

was warmer than the period 1991-2000 (MetOffice, 2008).

Monckton misrepresents Keenlyside et al, 2008, that ‘There may be no new warming until 2015’. This work describes a novel method of incorporating ocean circulation into climate models. The results, which are provisional, suggest there may be short-term cooling around the North Atlantic which could temporarily offset the longer term effects of increasing greenhouse gases. Keenlyside predicts a pick-up in temperatures for the decade 2010-2020 to coincide with the IPCC’s expectations (Romm, 2008).

Monckton is disingenuous in implying that the IPCC is at variance with ‘peer-reviewed climate literature [that] is near-unanimous in not predicting climate catastrophe’.

The IPCC presents the balanced view that ‘the frequency and intensity of extreme events are expected to change as earth’s climate changes and the changes could occur even with relatively small mean climate changes (IPCC, 2007)’. Monckton says ‘all economists except Sterne’ think that ‘...adaptation [to such events] if necessary would be far more cost-effective and less harmful than mitigation’. In fact, a number of prominent economists agree with Lord Sterne that traditional cost-benefit analysis is inappropriate, even unethical, when applied to inter-generational climate effects and that Sterne’s case for early action on greenhouse gas emissions is fully justified (Howarth, 2007; Weitzman 2007; Zenghelis, 2008).

In short, Monckton’s article is based on a selective and misleading reading of the scientific and economic literature. philip.coghlan@virgin.net

## Impossible to predict

FROM ASHLEY CATTERELL (Materials 52)

CONGRATULATIONS on allowing Lord Monckton space to challenge fashionable views on climate change, and for the splendid pictures of the sun on the covers of *Imperial Engineer*. You are right to point out the huge economic and social consequences of current initiatives to reduce CO<sub>2</sub> generation. However, taken together, the uncertainties of

climate change forecasting, and the related uncertainties of economic, technological and population growth world-wide, means that attempts to forecast energy scenarios 50 years ahead are absurd. There are many more immediate problems requiring the world’s attention and resources. Remember, the only certain thing about forecasting the future is that you will be wrong.

Jacatterell@aol.com

*Alumni share their views...Alumni share their views...Alumni share their views...*

## Climate change – need to act now

FROM RICHARD HAMPTON  
(Materials 85)

I FELT I must write concerning the centre feature in the last issue. I felt I was in a time warp when I read the headline 'Climate change – are humans to blame?' This may have been acceptable 15 years ago, but with all the peer reviewed research since then, it is not justified now. We should not still be having this argument. This is not stifling debate. The debate has been had. Science is rarely 100% conclusive, but there comes a point when we need to stop debating and start acting and that time is right now!

Aside from this I felt the article was very poorly edited. I was naturally drawn to the SUMMARY for the conclusions of the feature. However, this was only the summary for Lord Monckton's article (I believe). This should have been made absolutely clear.

The two viewpoints were written in such different styles it was impossible to come to any informed conclusion.

Professor Haigh gave a reasoned discussion with some examples, but being a scientist, did not dismiss other arguments, rather claimed there was little evidence for them. By contrast spin doctor and classics scholar Lord Monckton (interesting that you couldn't find a scientist to provide a counter view) gave a slick, sound-bite response.

I suggest it would have been far better to let Professor Haigh counter each of Lord Monckton's points. This was a

very poor article which should not have been given star billing. We need to act, not rake over old arguments.

A couple of pages later we had a feature titled 'Nuclear fears understandable but misplaced'. The author seems to be living in a bubble of self-satisfied delusion. Sweeping statements such as the claim that there is 'essentially no risk to the public' from modern nuclear plants are extremely simplistic and misleading. The safe disposal of nuclear waste is similarly dismissed. No one has yet managed to safely dispose of any nuclear waste.

The article also completely failed to address the wider social and environmental implications. If Britain adopts nuclear power as a low carbon energy solution what right have we to deny this to other countries? Also, nuclear fuel is not renewable and widespread adoption will result in a 'peak uranium' scenario in a matter of decades. Is there a secure source of the fuel? The timescale to build new plants is too long to prevent dangerous climate change. In short, nuclear fission is a red herring and only distracts from the need for urgent massive investment in renewable technologies.

*richard.hampton@btinternet.com*

**THE EDITOR REPLIES:** *The centre spread article was as received because we had been asked that each contributor's comments on climate change would remain unaltered. Also by request, neither contributor had sight of the other's contribution.*

## Another 'even if' added

FROM ANDREW HILL

(Chem Eng 72)

CAN I add one more EVEN IF...? EVEN IF climate change is a 'non-problem', there is no doubt that easily accessible energy sources, especially the fossil fuels (crude oil, natural gas) are becoming increasingly rare and give the countries in which they occur unreasonable economic power.

It is unfortunate that these countries also tend to have less than benign policies of global tolerance and/or plans of global domination on cultural, political or religious grounds.

Therefore, notwithstanding the reality, or otherwise, of climate change, it is a clear necessity for the liberal democracies to develop alternative energy supplies to enable that way of life to continue, both in the economic and cultural senses.

This is rather than being subsumed into the more extreme geo-political or economic control of religious or imperialist states, who happen to be richer in fossil fuels.

*ahsolo@talktalk.net*

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**IF YOU WANT TO JOIN IN THIS OR ANY OTHER DEBATE, WRITE TO [t.sergot@imperial.ac.uk](mailto:t.sergot@imperial.ac.uk) OR [rosemary.tipples@imperial.ac.uk](mailto:rosemary.tipples@imperial.ac.uk)**

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## Comment addition

FROM ASHLEY CATTERELL

(Materials 52)

FOLLOWING my last e-mail on climate change, this is to say there is a paper in the March issue of *Materials World*, the house journal of the Institute of Materials, from a geology professor in Adelaide, on climate change.

The substance of the paper is to claim that geological studies show that there has been no correlation between carbon dioxide levels and the temperature of the planet over the past 600 million years, even though CO<sub>2</sub> levels reached 7000 ppm at times, yet the temperature has remained constant.

I have no means of knowing the validity of this work, but I am sure there will be people in the College who can express a view. *Jacatterell@aol.com*

## Sustainable driving future?

FROM PETER VERNON (Met Mat 54)

ON PAGE five of the Autumn edition of Imperial Engineer there is a short article with the above title.

I do not doubt the quality of the work done at IC on vehicle power systems but I do deplore the statement that 'hydrogen powered fuel cells emit nothing but clean water, offering the prospect of pollution-free motoring'.

The second part of that statement is nonsense: how on earth is the hydrogen supposed to be generated without emission of carbon dioxide? *novern@telkomsa.net*

**THE EDITOR REPLIES:**

**YOU ARE, of course, correct that unless**

*hydrogen is produced via electrolysis using electricity from nuclear, hydro or wind power generators, CO<sub>2</sub> will be a co-product somewhere.*

*I think we got lured down the hydrogen path because we have been conditioned to think only in combustion terms when it comes to automotive propulsion. Electric vehicles for ground transport present technological challenges but these are probably a lot more manageable than the H<sub>2</sub> route (see page 14 in the Spring 2008 edition of Imperial Engineer).*

*Of course, whether we have the will to transform our generating and distribution capacity to accommodate this demand is another question entirely!*

## New venue fits the bill

THE 60 Chem Eng group meeting this year was held at IC in the college bar over lunch. Our regular venue (The New Cavendish Club) had advised us that their bar, having been reduced in size to provide more restaurant space, is now too small to hold our group. A private room would have cost us a fee

Cost benefit analysis, followed by exploratory visits (thanks Don) to alternatives caused our change to the IC bar – which seemed very pleased to have the business!

The change met general approval so is also proposed for our next gathering scheduled for February 10 2010.

Thanks again to Dave Martin for the Belgian chocs! (well-deserving of the Belgian medal for gallantry in support of Belgian industry!)

Next year, being the 50th anniversary of our graduation, we propose to have an evening celebratory dinner. Mike Heath is organising the event for which a suggestion is dinner at The College of Arms,

# ALUMNI NEWS & VIEWS

Four pages of who's doing what and where



London. Anyone not present at our meeting who might be interested to join in, please contact me.

**Tony Davis**

ardavis@btinternet.com

*In the IC bar, from left, Jim Friend, Alan Nethercott, Brian Stevens, Malcolm Cross, Tony Davis, Dave Martin, Mike Heath, Don Latimer, Paul Gallagher and Barry Daniels.*

## IN BRIEF

### Sam in Sydney

JIM KEHOE (Mech Eng 62) and Bill Macmillan (Chem Eng 62) met Kumar (Sam) Samantha (Civils 57) for lunch during his visit to Sydney in January. Sam hails from Virginia and was taking the opportunity to spend time with his son in Sydney.

### Lunches planned for NSW

OCCASIONAL lunch meetings for 'Imperial Engineers in Sydney' are being planned. Would those interested in attending contact either Jim Kehoe (jpkehoe@bigpond.net.au) or Bill Macmillan (macmillanw@bigpond.com)

### USA backs dig

NIGEL FITZPATRICK (Met 65) reports that the US is funding a project to examine the conservation of Fort Dufile in Uganda. A small team has looked into next steps for this archeological site. Nigel says: 'It's good to see the small wingflap started by IC students in 1965 is still creating ripples!'

## Electrical reunion surges with publicity

FOLLOWING the article in *Imperial Engineer*, the annual reunion of the Electrical Engineering 1978–1981 undergraduate class continues to grow.

Last September, I met in the Union Bar and then went on for dinner in a Bayswater restaurant

Why not get in touch? Better still, come along to

the next one. Please email for details alan.r.higginson@btinternet.com

*From left, back row, are Mike Casey, Alan Higginson, Krishna Thakrar, Sunil Morzaria, Ian Tyes, Roger Edwards and Trevor Hall.*

*From left, front row Henry Szyszko, Arthur Jordan, Yogesh Joshi and Keith Prior.*



## Memorial dinner

ANOTHER dinner to celebrate the life of Nick Perrier (Geology 99, MSc 00), who died in 2006, will be held this summer. Anyone who knew Nick is welcome, says Rosamund Gray (*née Hodgson*). Contact her for details on celebratenick@hotmail.com

## Calling all engineering geologists

PREPARATIONS are underway to mark the centenary of the foundation of engineering geology at Imperial College.

If you have the words engineering geology in your degree title an event in 2010 will be of interest to you. You are a member of the Herbert Lap-

worth Club whether you know it or not, if you graduated with either an MSc in engineering geology or a BSc in geology with engineering geology

A brief account of Herbert Lapworth can be found on the website for Engineering Geology. He was a distinguished

engineer who brought engineering geology to Imperial in 1910. It has been taught continuously since then.

A two-day meeting, to be held in South Kensington in July 2010, will consider a wide range of current issues within engineering geology.

## Can you explain scarf colours?

IN THE last issue, Richard Hudson (ESE 82) asked why his old Imperial scarf was missing a stripe found in the current one. As a result, he wasn't sure what to buy (or where).

Unfortunately, despite extensive research by College archivist Anne Barratt, both for us and in the past, we're still not

able to answer the question.

The extra stripe in the Imperial scarf is for Medicine, which recently joined the other three constituent colleges – City & Guilds, Royal School of Mines and the Royal College of Science.

However, if you can tell us why the specific colours were

chosen, we'd love to hear.

In the meantime, Imperial scarves and other regalia can be bought online from the College shop. Otherwise you can buy in person.

If you would like a City and Guilds' or RSM scarf, or other regalia, contact Teresa Sergot or Rosie Tibbles.

## Still snug

LUCKY Andy Clark (EE 94) still has his scarf. He writes: 'In the cold weather, I dug deep in the wardrobe and found my City and Guilds scarf. I bought it back in College to keep me warm whilst walking around the parade route for the Lord Mayors Show. It's still doing a fine job keeping me warm.' fleacircusdirector@googlemail.com

## Following father's footsteps

MY DAUGHTER Catherine on her gap year visiting from South Africa and staying in London last year, joined the chorus of the IC Musical Society for their summer production of Bernstein's *On the Town*. They put this on (as they have done musicals

for many years) in Budleigh Salterton, Devon.

She thoroughly enjoyed the experience and getting to know the Beit Quad bar.

**Mark Cresswell**

DRA Mineral Projects, South Africa MarkC@drasa.co.za

## New Cavendish membership

**CORPORATE membership, set up by CGCA and RSMA, entitles all members to use The New Cavendish Club, near Marble Arch, in London's West End. It is an elegant private members club, steeped in history and a wonderful venue for functions, meetings and private dining.**

**The Club has a variety of meeting rooms available for private hire, to suit a wide range of events, from a small private dinner party for six, to a large conference for up to 80 people. The Club is able to tailor each event to meet individual needs. For all information relating to private functions, please contact Deborah Roberts, meetings and events manager, on 0207 723 0391.**

**The Club also has 35 bedrooms, most with en suite facilities. The restaurant and bar serve freshly-prepared food and the drawing rooms are ideal places to relax, enjoy afternoon tea or simply catch up with friends and colleagues. More information is available by visiting their website: [www.newcavendishclub.co.uk](http://www.newcavendishclub.co.uk)**

**NOTE: A membership card is not needed to enjoy the facilities.**



## Was that Jim?

ON PAGE 25 of the last Imperial Engineer was a picture of Jim 'Beat' Smith describing life at Imperial in 1958.

Jim Kehoe (Mech Eng 62) and I wonder if this is the same Jim Smith who, in 1958, organised a rugby team for 'old lags known simply as 'Jim's team'.

If it is please give him our regards and if possible ask him whether his OBE was really 'for services to the police'!

Thank you for a very in-

teresting issue. **Bill Macmillan** (Chem Eng 62)

## TWO ATHLETES...

SEE next issue for news of two alumni who are still pursuing their sports despite the passing years.

Although in his 80s, Gordon Dear is still skiing and rowing. In Canada, Ed Whitlock, in his late 70s is a marathon runner who often beats runners half his age.

## WE NEED YOUR NEWS

Let us know your news and stories.

Or have you an idea for a feature?

Editorial assistance is available!

Contacts are Teresa or Rosie  
(address on page two).

**COPY DEADLINE FOR NEXT ISSUE IS  
August 14 2009.**

**Any pieces not published in this issue  
will be published next time.**

# Citizen Lucking was spotter of dodgy statistics

FOR HALF a century, Tony Lucking was the voice of Britain's air transport consumers. His sobriquet, Citizen Lucking, was earned at licensing hearings in the 60s when scheduled air services were the monopoly of BOAC and BEA. He lived to see independent competition, financial transparency, and improved cost and traffic data.

Lucking was a 'numerate engineer' who applied hard, verifiable data to his arguments. His air transport database, stored in his computer and on the windowsills of his Covent Garden flat, was probably the most comprehensive in private hands.

A keen spotter of dodgy statistics, he engaged in reason rather than polemics, aimed primarily at public policymakers — ministers, civil servants, MPs, editors and professional bodies. In the battles about where to locate a third London airport, he argued for better use of existing assets such as Stansted.

In the debate about a third Heathrow runway, he advocated better use of the two existing runways, operating them in mixed mode (sequenced take-offs and landings) as is safely done at Chicago and other US cities. A third runway would be needed, but it should

be short and reserved for small, quiet regional planes

Anthony James Lucking was born in Birmingham in 1925 and won a scholarship to Imperial College at 16. He qualified as an electrical engineer after war service and worked for Standard Telephones and Cables and then management consultants Urwick Orr.

In 1961, Tony became managing director of Waddington & Duval, where he invented a plastic press-tap for wine boxes, making considerable money for the company.

In 1990, he retired and stepped up his air transport

research, extending them to rail, sea and road transport.

Citizen Lucking was independent, unpaid, unstaffed and remained a bachelor. He was a member of the Airline Users Committee and its honorary consultant for many years, a Freeman of the City of London, an adviser to the House of Commons Transport Select Committee, a member of the Worshipful Company of Carmen, a Fellow of the Royal Aeronautical Society, a member of the RAeS Air Transport Group, and a glider pilot.

Tony died on December 22, aged 83.\*

## CGCA life member

HUMPHREY HOLME, died on November 6. Humphrey was a CGCA life member, and had attended Mech Eng from 54-57.

## Successful move to Australia

DAVID PECKHAM, who died on December 13, emigrated to Australia with his family in 1962.

He graduated from Mech Eng in 1945, and as a PG in 1948 and worked as a consulting mechanical engineer for Merz & McLellan and Partners for many years and on many projects.

Notable among these were bulk iron-ore terminals at Dampier and Port Hedland, container-handling cranes at the Port of Melbourne and cooling towers of the Loy Yang power stations in Victoria.

Upon retirement from Merz & McLellan, David remained active and widely respected in the profession, founding his own consulting practice.

**Complete versions of the obituaries, marked at the end with an asterisk \*, can be found on the website addresses on page two**

## Dick – a typical miner

*This memory of Dick Potts (Min Eng 66) is from a much longer one put together by his friends Barry Sullivan, John Moss, Mike Sandy and Ginger O'Reilly. He lost his fight with cancer on Septem-*

BORN in Kenya in 1945, Dick Potts had a life that was one adventure after another. Following education in Rhodesia, he joined mining at RSM and whole heartedly entered into undergraduate life.

On leaving RSM in 1966, Dick started what was to become a very successful career as a mining engineer, initially in Zambia.

Then Dick and Catherine (the nurse he had married and who was from then on his best friend) moved to South Africa in

the late 70s, then Oman, Bristol and, finally, Australia

Dick's life revolved around three things – family and friends; his passion for sport (especially rugby), and his professional career as a mining engineer.

The vast majority, once they met Dick, remembered him with respect and great affection.

Dick's career was like Dick – noisy, colourful, lots of variety, and successful. He was a highly respected mining engineer and mentor with a very strong emphasis on operations.\*

## A wise and good friend

NANDIKISHORE Chitre passed away in October in Foster City, California.

Kishore was at Imperial from 1957 to 1962 receiving a DIC in electrical engineering and a PhD in physics. Born in Calcutta, he earned a BSc, MSc and a Master of Technology (IIT) in India before coming to C&G.

Leaving IC, he was employed by RCA in Montreal on microwave systems. From 1968, Kishore spent 20 years in satellite communication, working for COMSAT and INTELSAT in the Washington DC area.

At INTELSAT, he was director of system planning, oversee-

ing the concept of Intelsat VI, the most advanced satellite of its type at that time.

Kishore retired to Northern California in 1989 and became one of the founding members of IC Alumni Northern California. He was president of the group in 1997 having been newsletter editor.

Kishore enjoyed good company, tennis, golf and fine wine and as he said: 'you don't have to be a nerd to be an engineer'. He was a wise and good friend and will be missed by many.

Kishore supported multiple charities. Donations in his memory should be sent to UNICEF, his favourite charity.

## An expert in batteries

MY FATHER Leslie Prout (Elect. Eng 34) died on February 28 in Lerwick, Shetland. After graduating from City & Guilds, he worked for Gaumont British on early sound films. At the Royal Aircraft Establishment, his expertise in electronics was harnessed to battery technology which then became his area of expertise.

Later my Father became technical director of Oldham Batteries, finishing his working career at Alkaline Batteries and Compton Parkinson. His interest in battery technology continued until just before his death.

**Tony Prout (Mech Eng 64)**

## He was an inspiration to all

JOHN FLEMING WILSON spent much of his distinguished career with Taylor Woodrow. He moved from India to the UK to Western Australia (as MD) where he was involved with many of the huge infrastructure and mining projects which are a mainstay of this state.

His enthusiasm for work and Imperial College (WA alumni chairman, Hon FIC) spread to all around him. He found time to be a great supporter of a wide range of community endeavours where his sound engineering and can-do attitude combined to achieve amazing results.

John died on September 17.

## Highly-respected by all

PETER VIPAN (Min 44) died peacefully aged 87 on November 10. He was RSMU secretary in 43-44. An accomplished rugby player and cricketer, he was also a first class mining engineer and, above all, a real gentleman.

When informed in 1959 that Peter had given me my first job, our long-serving Union barman Ted Smith replied: 'You'll be alright with Mr Vipan, sir!' That sums up Peter – always highly respected by colleagues and workmen alike.

As a mining student in 1940, Peter was classed as being in a reserved occupation.

Less than a year after graduation (with a first) he was at Champion Reef Mine on the Kolar goldfield, soon finding himself in charge of a section of the mine with 300 men, 7,000

ft underground. In those days Kolar had the deepest mines in the world.

Returning to England in 1948, Peter became the manager of a small barytes mine in Devon, giving him the opportunity to play cricket for Dunsford and rugby for Exeter.

Two years later the mine was bought by Laporte Industries and he was appointed group mining engineer based in London. He moved to Derbyshire in 1964 to take charge of Laporte's fluorspar operations near Eyam, retiring in 1983.

Peter spent much of his retirement improving his golf. He continued to live in Eyam, a churchwarden and highly-respected contributor to the local community. He was married to Sheila for 51 years. **John Bramley (Min Eng 56, 59)**

## Career grew in UK oil

COLIN FOTHERGILL ARSM, BSc (Oil Tech 48), died suddenly on November 5. He joined the Kuwait Oil Company and in 1954 was awarded DIC and PhD. In that same year, he was appointed lecturer at RSM and remained an academic for the next 16 years.

In 1971, he was appointed chief geologist for Tricentrol. In later years he consulted, particularly on UK on-shore activities. He retired in 1990. **John Sharpley (Oil Tech 53 and 54)**

## An oil man through and through

P HUGH HUCKIN 1950-56 Oil Technology ARSM, BSc, was an oilman through and through. He came up to RSM in 1950 after schooling at Haileybury, but his studies were put aside whilst he did National Service. He was commissioned in The Royal Corps of Signals.

On returning to RSM to renew his studies, he was active in the Union, being elected president 1955-56. He was a fine boxer and a member of the Chaps Club.

On graduating he joined Shell and was posted to Colombia. In later years, he held senior positions in other major oil companies and then set up his own oil consultancy. He retired in 2001.

Hugh's interests were wide and in later years he taught himself to sail and subsequently enjoyed sailing his yacht in the Solent and afar.

He died in May 2008 and is survived by his wife Anne.

**John Sharpley**

## Obituaries in brief

NOTICE has also been received of the deaths of the following CGCA members...

SRUTIRAJ GHOSH (Mech Eng 35) in 2008.

ALAN K SARGENT of Portishead, Avon, (Mech Eng 50), on August 26.

DR WILLIAM GEORGE BUR-

ROWS of Axbridge, Somerset (Elec Eng 63 and 77), on December 28.

IVAN KINNERSLEY NIXON of Goring, Berkshire (Civils 39 and 48), on September 8.

DR PHILIP OLDROYD of Acton, London W3 (Aero 41 and 47; Mech Eng 65), on March 18.

## Miners call for Mo



FOLLOWING the success of the 40th reunion lunch for those who graduated from the RSM in 1958, holding a special celebration of our 'golden' was never in doubt. Fond memories of surveying at Tywarnhaile made Cornwall the unanimous choice of venue.

The main event was a splendid lunch at the Penventon Hotel, Redruth on August 8, with 19, including wives, round the table.

The toast to absent friends fondly remembered Peter Tress, Jan de Villiers, Don MacPherson, Jock Wallace and Jack Clemmow. Duncan Andrew in Scotland and Barry Lanz in Bedford were unable to attend in person but were present at the lunch via a Skype connection, complete with webcam.

**A VERY happy occasion with Colin Chapman, Doug Owen, Tom Banks, Mike Mellish, Mike Fuller-Good, Colin Smith, Ian Plummer, Roger Fisher (Cape Town), Brian Wallace and David Thomas.**

This accounted for the whole year, apart from Maurice Jackson. So if you're out there Mo, please get in touch!

The weekend included an evening at the cliff top Minack theatre, a visit to the Eden project and, for the more able bodied, a climb to John's Shaft at Tywarnhaile itself, an impressive 300 feet above sea level.

It was generally agreed that the next reunion should be in five years time. **Brian Wallace**

## Miner's role change shores up businesses

MINE manager turned patent attorney Lewis Hands has started his own intellectual property (IP) services business and is trading as Handsome I.P.

Lewis graduated from RSM in 1990 but, after 10 years in mining and related industries, he realised that his true vocation lay in the quasi-legal area of IP.

Says Lewis: 'It's a mix of science, engineering and law and to qualify as a patent attorney you must have a technical degree'. Lewis retrained and worked as a patent attorney in, and for, private practice firms and in-house for a multinational.

'Having gained experience of engineering and industry at the sharp end I believe I'm more

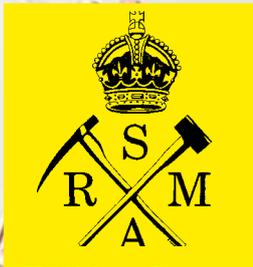
qualified than most patent attorneys to help clients protect and license their IP.'

He continues: 'I'm particularly interested in the minerals industry and more than happy to help start-ups protect not only their inventions but also their branding and trade names through registered trade marks.'

Lewis, who is a UK chartered patent attorney and a qualified European patent attorney, can be contacted via [www.handsomeip.com](http://www.handsomeip.com) and offers discounts to fellow graduates of Imperial.

Lewis is still involved with IC and visits regularly as he is a lay trustee on the Trustee Board for IC Union.





# Imperial ENGINEER

**BOTTLE RETAINED  
ALUMNITURN UP  
HEAT ON CLIMATE DEBATE  
MORE FUNDING FOR RESEARCH  
ENGINEERS INVENT CARBON  
CONSUMING CEMENT**

ISSUE 10: *SPRING 2009*

For members of

The City & Guilds College Association and The Royal School of Mines Association