Introduction from our new Head of Department, Professor Ian Burgess

The year 2005, the centenary of the award of our Royal Charter, has been very special for the University of Sheffield. The year of celebrations included a series of celebrity public lectures, 100 Centenary Scholarships, a quiz-night of 100 teams, a tall-ship voyage and a family day in Weston Park. This happened on a perfect summer’s day, and was the occasion of a narrow defeat for our technical staff in the Grand Final of the Centennial Inter-Departmental Tug-of-War Competition.

In Civil and Structural Engineering we were among a few departments which celebrated the centenary with a get-together for a large gathering of our own alumni at the beginning of July. Every generation from the 1940s to the 1990s was represented, including a large number of the Class of 1955. It was great for the current staff to see how much in common the groups had, how much they value their Sheffield connection, and the very lively interest they showed in the work of the present Department. It was good also to meet two ex-members of staff, Malcolm Clements who retired from the Department in 1982, and Bill Eastwood who went on to become the doyen of Sheffield’s consulting engineers after leaving us in the late 1960s.

I took over as Head of Department from David Lerner in mid-August, and I have to say that he could not have left me a department in better shape. Our staff numbers are the highest ever, at over 30, with an unprecedented 10 professors. We have a vibrant research scene, with a number of groups of real international standing and over 70 research students.

Our taught courses now cover a much wider range than was the case traditionally. Undergraduate intake has grown to 105 this year, and we now run taught MSc courses in both the Structural and Environmental areas of our activity which admitted 50 students this year.

Of course we cannot afford to let complacency set in, and the modern university context presents us with enough potential pitfalls to make this inadvisable anyway. We cannot be sure of the effect of top-up fees which come into the picture for next year’s undergraduate intake, but the Department is now prepared to work hard, both to recruit its students and to make sure that their experience here is an enriching one.
Success stories of the past year

For the 2nd time in 4 years, one of our students has won the Concrete Society National Student Award. Following on the success of Anna Tsartsari in 2001, HuiYing Zhu received the 2004 prize with “Use of Waste Glass in Concrete”.

To put this prize in perspective, the competition is open to any student of concrete at UG, MSc or PG levels at any UK University. The winner receives a night in London at the Concrete Society Awards Dinner (£150 a ticket), a 2-page spread about their work in the Concrete Magazine and a prize of £2,000. The requirement is to submit a report - it can be a UG or MSc dissertation or report, a PhD thesis, or in this case, an interim report specially put together for the competition.

Congratulations to Keith Emmett who beat four other finalists to win first prize (£200) in the Yorkshire ICE Young Geotechnical Engineers Paper Presentation Competition in November 2004. He gave a presentation entitled “Movement Of Soil And Groundwater Around Driven And CFA Piles In Layered Ground”.

Keith was also awarded the Cooling Prize by the British Geotechnical Association for his paper on the same research. The prize is the most prestigious award for young geotechnical researchers in the UK and was won against stiff competition from finalists drawn from academia and industry. The award enabled Keith to attend the International Young Geotechnical Engineers Conference in Osaka, Japan this past September.

Zhaohui Huang, Ian Burgess and Roger Plank have been jointly awarded the 2004 Raymond C. Reese Research Prize of the American Society of Civil Engineers. The prize is for a pair of companion papers on developments to the modelling of the behaviour of composite buildings (which includes most reasonably modern multi-storey steel- concrete buildings) in fire conditions.

The software Vulcan which was developed in the course of this is now marketed commercially by a university spin-off company called Vulcan Solutions.

John Roberts, who you may remember for his very enjoyable talk at our Centenary Open Day, has been awarded the Gold Medal of the Institute of Structural Engineering. John received his PhD from the University in the1970s, and has made his name as structural designer of spectacular theme park rides. He is best known as Director of the Engineering Consultants team for the “London Eye”, providing advice and certification for all aspects of the giant wheel.

Pete Skipworth’s company, SEAMS Ltd, won two awards at the Sheffield Business Awards organised by the Sheffield Chamber of Commerce and Industry in December 2004. Pete was a graduate in 1992, and obtained his PhD in 1999. He began the company with Mark Engelhardt providing advice on asset management strategies. The company has grown quickly, employing 30 staff (mostly with PhDs) and is looking to recruit a further 20 over the next year. They were awarded the Business Start-up prize at the Sheffield Awards, and were runners-up for the Information and Communication Technology prize.

The judges report: “We were impressed by the unique product that SEAMS have developed and their ability to apply the product to any organisation supplying public services. The product is a leading edge investment decision support solution and is typically aimed at large public sector organisations that are driven by service standards but also need to maintain or reduce costs.”

Stana Zivanovic won first prize at the UKGRAD Yorkshire and North East Hub meeting in Leeds in May for her poster “Modelling of Human-Induced Load on Footbridges”. Research students from twelve universities across the region came together for the poster competition entitled ‘Getting your message across: Presenting to the public’, at the University of Leeds. Stana’s poster was voted the best in this category by her peers for her poster on human perception of footbridge vibrations.

With the aid of a cartoon character called Peddy, Stana’s poster explained the problems associated with predicting vibrational motion on footbridges, and possible solutions which will help to improve modelling and hopefully avoid unexpected surprises in future, such as those experienced on the opening day of the Millennium Bridge.

Paul Reynolds and Jon Carr (SKM Anthony Hunt Associates) have been awarded the IStructE Sir Arnold Waters Medal for a joint presentation they gave on the Hull Kingston Communications Stadium, as the best paper given to a branch meeting during the year.
Sally Preston, 26, has been awarded the Young Structural Engineer of the Year award. The accolade, awarded by the Institution of Structural Engineers (IStructE), is made annually to a young structural engineer who has demonstrated outstanding performance and who shows exceptional promise for the future.

Sally, who graduated from Sheffield University with a degree in Structural Engineering and Architecture and is currently working for engineering consultancy Buro Happold in London, was awarded the prestigious accolade for her work on Palestra, a 12 storey office development located on Blackfriars Road in Southwark, London. Sally’s involvement on the project involved interaction with the architect, client, fabricator and also mentoring graduates working on the project. “I'm delighted” said Sally. “To have your enthusiasm and hard work recognised is very rewarding.”

When asked why she chose structural engineering as a profession Sally explained, “I did an architecture and structural engineering degree at Sheffield University because I originally aspired to qualify as both. After completing my degree, I began working as a structural engineer to gain experience but five years on I find the role continues to present me with multiple challenges in creative design, problem solving and mathematics. It is especially satisfying to be involved in the creation of a tangible product; being involved from the initial design stage through to on-site construction and seeing the finished building.”

Sally’s win is encouraging evidence that young female structural engineers have a great deal to offer the profession and increasingly achieve outstanding success in this male-dominated industry. Sally commented: “The male/female imbalance is a fact within the construction industry but shouldn’t deter young women from pursuing a career in engineering. An ever expanding mix of race, culture and creed as well as the male/female balance can only enhance the design solutions that we adopt.”

Sally received her award at IStructE’s annual Structural Awards ceremony in November in Canary Wharf, London.
Comings and goings

After more than forty years as a valued member of staff, **Dai Thompson** retired from the Department in September. The number of people at his retirement party was testament to his popularity and dedication to the Department. We were pleased that his wife was also able to attend and wish them both well with whatever they decide to do in the future.

On the other hand we are pleased to welcome **Rachel Horn**, who joined us in September as the Teaching Fellow in Civil Engineering Practice. Rachel did her PhD in Cambridge, and looks forward to her teaching here. “Communication is the main thing in civil engineering once you have done your calculations – communication with the clients, the contractors, and the public” says Rachel. Triathlon is a big part of her life, and she is a regular member of the British Triathlon team, competing most recently this summer in Denmark and winning the team gold medal at the Long Distance World Championships.

We were sorry to say goodbye also to **Roger Crouch**, who has moved on to the University of Durham to take up a Chair appointment in the School of Engineering there, and to **Bill Anderson**, who is retiring to Cornwall at the end of the year. Bill did a lot of work towards the Industrial Partner scheme, which has given many of our students valuable placements during the summer vacations.
Historic bridge provides missing link in riverside walking route

It was developed in 1945 and played a part in the downfall of Hitler’s Nazi regime in Europe, but this Bailey bridge has been given a new and altogether more peaceful lease of life in Sheffield. The walkway now stands above the River Don as the final link of the Five Weirs Walk, a path linking Sheffield City Centre to Meadowhall and the TransPennine Trail.

It is particularly appropriate that the Bailey bridge was located here, as they were the brainchild of Sir Donald Bailey who not only was an undergraduate of this department but also received an Honorary degree at the University.

Bailey built model bridges as a hobby, but realised the practical opportunity for his invention when the Second World War began. His bridge could be built from standard lightweight modules in a matter of hours, and were yet strong enough to hold tanks. Hundreds were built and used in the War enabling allied troops to cross rivers, and Field Marshall Montgomery is reported to have claimed their use shortened the conflict by several months.

In peacetime they have been frequently used in the aftermath of several natural disasters, including floods and earthquakes.

The bridge over the River Don has been restored and adapted to its new purpose by workers at Mandall Engineering of Sheffield, who fitted contemporary lighting and stainless steel parapets to the structure in the Forgemasters River Don Works, the only building large enough to contain it. It was brought to the site by road in two sections, and fixed in place by Land and Water Ltd in October this year.

The secretary of the Five Weirs Trust, Simon Ogden, explained “We are now in sight of the goal we set ourselves back in 1986 of completing a walk from Lady’s Bridge (in the city centre) to Rotherham. The Bailey Bridge will join the medieval Lady’s Bridge, the massive Wicker Viaduct, the contemporary Cobweb Bridge and the soon-to-be-built Brooklyn Bridge, to give the River Don in Sheffield a spectacular sequence of unique structures”.

Sir Donald certainly put his engineering degree to good use, despite failing his maths paper the first time, and it is fitting now that Sheffield now has its very own example of his most famous invention.
What we are doing

Professor Richard Ashley has been appointed as Chief Scientific Adviser to the House of Lords Select Committee on Science and Technology to investigate the future management of water in England and Wales.

The Environment Agency recently voiced concerns that the water companies are concentrating on developing new supply rather than managing demand. As demographic and economic development changes, and the effects of climate change will come into play, it is important to consider the whole range of water management.

For example, do we know the likely future trends in water demand, and can the behaviour of consumers be influenced? Is sufficient research being done to predict and plan for future scenarios? And how does water figure in the development of Government policy for housing, land use planning and industry? The answers to all these questions and more will be explored by Richard and his team of twelve peers.

Visits to Yorkshire Water (the top performing water provider in the UK) and Essex & Suffolk Water Authority are planned, as is a trip further afield to Australia where leading edge management techniques in water saving strategies will be studied. The final report is due by Easter.

The Kroto Research Institute

Part of the Department of Civil & Structural Engineering now occupies the Kroto Research Institute. The Groundwater Protection and Restoration Research Group moved to the Institute in July to become part of the new multidisciplinary science and engineering hub called the North Campus. This development reflects the University’s view of the growing importance of multidisciplinary research, putting Sheffield at the forefront of University practice.

A number of themes are represented, falling across areas of emerging science and hi-tech application. Two important threads running through the research are nanotechnology and the convergence of the physical and biological sciences.

Multidisciplinary research offers a number of benefits. It provides faster understanding of emerging areas of science and engineering by bringing multiple perspectives to bear on any problem. By transferring concepts and skills between disciplines it fosters a creative environment where major breakthroughs can be made. Thirdly, it allows a better interface between academic research and industrial application, the latter being inherently multidisciplinary.

Researchers from different scientific and engineering disciplines are working alongside one another to facilitate broader interaction. Departments represented on North Campus besides Civil and Structural Engineering include Automatic Control and Systems Engineering, Chemical and Process Engineering, Chemistry, Computer Science, Electronic and Electrical Engineering, Engineering Materials, Mechanical Engineering, Molecular Biology, Physics and Astronomy.
Roger Woodhead, a graduate of 1967, is Technical Director on the $1.9 billion RAV Rapid Transit Project in Vancouver, Canada. Following his BSc from Sheffield, he went to Canada to do a masters degree and has stayed ever since! He founded Woodhead Consultants in 1995 after a diverse career in construction and consulting.

The Richmond • Airport • Vancouver Rapid Transit Project (RAV Project) is a rail-based rapid transit line that will link central Richmond, the Vancouver International Airport, and Vancouver along the Cambie corridor to the emerging transportation hub at Waterfront Station. It will be an automated light metro system, using an electric propulsion system.

The RAV line is a significant element in the Greater Vancouver’s regional transportation network, providing much-needed access between dense and growing residential areas and key employment, commercial, hospital and institutional centres. It recognizes the importance of providing transit services that present a real alternative to the automobile.

This is critical for all residents, transit users and non-users alike, since improved services will help address the escalating congestion on our roads and bridges and assist with the movement of people, goods and services throughout the region. It will make the city more sustainable as well as more attractive to live in.

Greater Vancouver and Whistler are hosting the 2010 Olympic and Paralympic Winter Games. The addition of this link to the rapid transit network makes a new and different kind of traffic planning possible for Olympic events. Traffic planners have identified the opportunity to create an Olympic zone in the central city, with enhanced transit services and limited vehicle access, and a plan like this clearly contributes to a more sustainable Winter Games.

The line is 19 km long with 16 stations, and will improve existing rapid transit service by increasing capacity equivalent to 10 road lanes. It will connect with SkyTrain lines that run through the eastern part of the region and the SeaBus serving the North Shore. It consists of three sections, a bored tunnel, a cut and cover tunnel, and an elevated guideway.

The RAV line will be partially financed, designed, built, maintained and operated by InTransitBC who were selected through a competition and negotiation process. This innovative approach to a major project (multi-agency collaboration and private sector involvement) is designed to result in the best transit solution at the most competitive price, and to protect the public’s investment over the long-term.
Alumni News

It was good to catch up with you at the Centenary Open Day in July. Here is some of your news:

Mike Bullas (class of 1960)

“From graduation in 1960 I spent 2 years in Norfolk with Consulting Engineers trying to drain the Fens yet again! Then I went to West Riding County Council designing and then supervising construction of bridges on the M1 motorway, followed by 16 years with John Laing Construction mainly with responsibilities for technical supervision of motorway construction. I then spent some time with Shepherd Hill Construction, mainly designing permanent and temporary bridgeworks. I finished with a spell of 10 years in Secondary School Education, trying to enthuse pupils in technology.

I can’t think that this could be of interest to anyone but it provided me with a modest income and at times a feeling of great satisfaction. I am sure that present students will face a challenging future but without their input our society would find life less comfortable”.

Jaffel Versi (class of 1999)

Jaffel was responsible for designing the structural elements of the new English Institute of Sport project in Sheffield. Working for SKM Anthony Hunt, his current projects include the Adult Learning Centre at Wolverhampton College and buildings for the new campus for the Tresham Institute in Kettering.

Keith Attfield (class of 1971)

“After graduation I spent two years of motorway design work before becoming a reporter for the magazine New Civil Engineer. A year later I became the deputy editor of the new magazine Offshore Engineer launched by the Institute of Civil Engineers amid the excitement of North Sea oil. After some interesting years with this publication I did an MBA at London Business School between 1977-79, and then joined a group of water engineering companies to launch my management career.

Another change of emphasis followed in the nineties, and I am now in Paris responsible for all the IT and business systems in a French international company called Veolia Water Systems –they have operations in nearly 40 countries around the world.”

The Highways Agency appointed Derek Turner as the new National Traffic Director for motorways and trunk roads in England. He is responsible for co-coordinating the work of roadway maintenance teams and handling road congestion using the new national traffic control system.

Derek Turner (class of 1974)

Mr Turner has now spent twelve months in his new role. Previously he was the Managing Director of Transport for London Street Management. Part of his remit was to introduce measures which would improve streets for all road users, particularly pedestrians, cyclists, bus passengers and people with disabilities. This included creating the London Traffic Control Centre and the major redesign and pedestrianisation of Trafalgar Square. He was responsible for the design, introduction and operation of Central London’s unique congestion charging scheme.

A graduate from this department in 1974, he is a Chartered Civil Engineer and frequently gives evidence to the Transport Select Committee of the House of Commons and lectures internationally. He has served on numerous professional bodies and committees and was recently invited to join the University College London to be an Advisory Panel Member for the Civil and Environmental Engineering profession. He was Chairman of the Institution of Civil Engineers Transport Board from 1999. In June 2003 he was awarded the CBE for his services to transport in London.

Paul Carpenter (class of 1999)

On graduation, Paul went straight into project management for the mobile telecommunications industry with one of the largest construction companies in Finland. He has since worked on networks in Hungary, Thailand, Taiwan and Sweden, and is currently in Singapore, assisting Nokia in deployment of telecommunications equipment for a mobile operator. Paul comments “What is interesting about this industry is that most of the companies leading the way in the project management of network deployment have evolved from civil engineering companies”.

www.shef.ac.uk/civil/alumni

DEPARTMENT OF CIVIL AND STRUCTURAL ENGINEERING