



# Lichfield Science & Engineering Society

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## CHAIRMAN'S NEWSLETTER DECEMBER 2012

### WELCOME

Welcome to my second Christmas Newsletter. At present the membership stands at 324 and may I pass on our Treasurer's appreciation for the prompt payment of subscriptions together with the generous donations to the Education Fund which will be allocated in the New Year.

### MONTHLY LECTURES

Our September lecture was attended by 123 members and 11 guests and was given by Professor John Lucas from Rothamsted Research. Rothamsted is the longest running agricultural research station in the world. Founded in 1843 it has been providing cutting-edge science and innovation for nearly 170 years, delivering the knowledge and new practices to increase crop productivity and quality, and developing environmentally sustainable solutions for food and energy production. The lecture explored examples from current research programmes in crop improvement and protection, bioenergy, and soil science, together with national and global initiatives.

The October lecture was given by Professor Danny Dorling from Sheffield University entitled "Bring Social Statistics to life – Visualising Britain". 122 members and 7 visitors were present and unusual novel visualizations were used to display data from the 1971 - 2001 censuses to show how life chances have changed in Britain from around 1971 to today. He emphasised how inequalities between different groups have been defined geographically for example how rates of infant mortality, exam passes, university entry, unemployment, imprisonment, health, wealth and happiness varies throughout the UK.

In December Roma Agrawal from the WSP Group gave a presentation about the structural engineering involved in the building of the Shard in London. In 2011 Roma won the 'Young Structural Engineer of the Year' competition, she is passionate about promoting Engineering to students and women and regularly visits schools and universities to speak about her projects and career. She has been featured on Channel 4's "The Tallest Tower". Designed by structural engineers WSP and Architect Renzo Piano for Sellar Property, the Shard comprises 26 storeys of offices, 13 of apartments, three of restaurants and a 19 storey hotel. It is surmounted by a 65m tall spire, containing a public viewing gallery, bringing the total height to 310m. The talk highlighted the structural aspects of the Shard: its design, construction and unusual features. Roma explained the creative design and construction methods used during the build including the sustainable aspects of the tower. A record attendance of 148 members and 45 visitors enjoyed this enthralling lecture in the main theatre.

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## THE 2012 ERASMUS DARWIN MEMORIAL LECTURE

The 23rd Erasmus Darwin Memorial Lecture was given by Sir Paul Nurse, Nobel Laureate, President of the Royal Society, Director and CEO of the Francis Crick Institute. The lecture was entitled "Great Ideas of Biology" and was a sell out in the main theatre. When he was awarded his Nobel Prize Sir Paul wrote "Better understanding of the natural world not only enhances all of us as human beings, but can also be harnessed for the better good, leading to improved health and quality of life. It is also a truly international activity which breaks down barriers between the peoples of the world, an objective that always has been necessary and never more so than now. Scientific understanding is often beautiful, a profoundly aesthetic experience which gives pleasure not unlike the reading of a great poem."

Three of the great ideas of biology are the gene theory, the theory of evolution by natural selection, and the proposal that the cell is the fundamental unit of all life. When considering the question of what is life these ideas come together because the special way cells reproduce provides the conditions by which natural selection takes place, allowing living organisms to evolve. A fourth idea is that the organization of chemistry within the cell provides explanations for life's phenomena. A new idea is the central role that information management plays in generating biological organization.

## SCHOOL'S LECTURE

On Monday December 3rd 2012, Sir Alec Jeffreys gave a lecture at the Friary School Lichfield for 6th Formers from local schools.

The talk was entitled 'Genetic Fingerprinting; past, present and future'

Over 200 students came from 5 local schools. Sir Alec gave a clear picture of his work at Leicester University, where he pioneered work on genetic fingerprinting. It was inspirational for the students and staff, especially as the topic appears on the A Level syllabus.

This is the 4th such lecture that we have arranged for schools as part of our aim to encourage students to study Sciences and the students were most appreciative of the time Sir Alec took to engage with them.

## DISCUSSION LUNCH

The 20th September saw the table in the Lunar Room, at Erasmus Darwin House, once again filled by people eager to eat their delicious lunch and to discuss 'Educational Matters'. We had deliberately chosen a rather open and ambiguous title to see where this would lead the discussion - and we were not disappointed!

Mrs Susan Hannam, Acting Head teacher at The Cathedral School was asked to lead the discussion and she was joined by her Head of Science, Mr Jonathan Ewington. Mrs Hannam described the minefield of different types of school which were available for parents to choose from in the secondary sector and Mr Ewington explored the provision of science. The members present were eager to express their own views about all kinds of education matters ranging from the problems associated with catchment areas and higher education. We were disappointed when 3.00pm arrived and the meeting had to be drawn to a close.

## ANNUAL DINNER



This year we returned to Aston Wood Golf Club for our Annual Dinner where the after dinner speaker was Simon Gulliver, Plant Collections Manager at The Birmingham Botanical Gardens and Glasshouses. The meal was attended by 76 members and their guests to whom Simon gave an illustrated presentation about the Birmingham Botanical Gardens which were founded in 1829. Planning and construction took three years and the 18 acre gardens opened to Society members on June 11 1832. Today, in addition to invaluable research and conservation work, the Botanical Gardens are a very popular visitor attraction and a regular venue for school visits.

## VISITS

In September two groups of 20 members, visited Bombardier Transportation at the Midland Railway Carriage and Wagon Works in Derby. Although hard hit by the Government's decision to award the contract for ThamesLink to Siemens Bombardier had secured a large order for London Underground and were also bidding for the Crossrail contract. Rolling stock is built on a production line basis with some interesting features such as building the roof upside down, which makes it much easier to install the services.

Simon Dingle, Project Director for the New Library of Birmingham, spoke to the Society last season and thereafter he personally conducted eight parties of ten members around his work in progress. When the library is completed it will be hard to imagine the complexity of the construction and the services which will then be hidden and it was good to appreciate the work involved and the difficulties of erecting such a massive building on such a restricted and busy site.

In early November 20 members visited Castings PLC, at Brownhills, the largest malleable iron foundry of its type in the UK, producing 30,000 Tonnes of castings annually, much of it for export as truck engine and suspension parts. We were privileged to be shown round by the Chief Executive, David Gawthorpe, and his colleagues. We were able to see scrap steel being melted, during which process the elevated deck on which we stood trembled as a result of the massive electrical current used. Then followed the light spectacle as magnesium was added to the melt to produce spheroidal iron and then the pouring of molten metal into multiple box-less sand moulds. In the on-site ultra modern machining facility, we witnessed the resulting castings being machined to close tolerances by million pound twin horizontal spindle machining centres.

On 22nd November 16 members visited the Royal Ordnance Factory at Radway Green, Cheshire, now owned by BAE Systems-Global Combat Systems Munitions, where one million rounds of small arms ammunition is made per day. An informative presentation was followed by a factory tour where we saw short brass cup slugs being transformed by a series of automatic, highly rapid, reverse extrusion press operations, into 5.56 and 7.62 mm one piece, cartridge cases, all to unbelievably close tolerances. In the Bullet Production unit, we watched as kilometres of lead wire were similarly transformed into bullets. It was somewhat of a relief to hear that the major proportion of the ammunition is used in training. We were also shown the, soon to be operational brand new MASS unit (**M**unitions **A**cquisition - **T**he **S**upply **S**olution), resulting from a 15 year Government contract, which will have even more capability.

In December the venue was Pilkington's Cowley Hill Glassworks in St Helens. The 750 yard Float Glass production line process starts with the addition of sand and ends with a ribbon of perfectly flat glass of up to four and a half metres wide and 15mm thick. The heat and fury in between, with molten glass, molten tin, cutters to produce the 3.21 x 2.25 metre standard



sheets, conveyors and stackers make very impressive viewing. Unfortunately a second visit, scheduled for January, has been cancelled but we hope to reinstate it later in the year.

#### IN CLOSING

As you can see from the attached information we already have some interesting outings planned and more are in the pipeline. Regrettably general popularity means that visits are usually limited to “members only”.

Arranging and organising these visits takes a surprising amount of time and members are asked to check all details carefully. Particularly if you find you cannot take up your place, let us know immediately. Most visits are oversubscribed so even at the last moment we can offer places to someone else.

I should like to make members aware that applications for all functions and visits will be acknowledged; by either Tim or Mike for the visits; or Roy for the Discussion Lunch, Annual dinner and Summer Supper.

Finally I would like to thank all of the Committee for their hard work in the smooth running of the Society.

I wish you all a pleasant and peaceful Christmas.

Paul Bettson

Chairman