

# Lichfield Science & Engineering Society

PATRON

Sir James Hawley KCVO TD JP  
H.M. Lord-Lieutenant of Staffordshire

CHAIRMAN

Brian Hammond DipEE, DMS, MIET  
Chartered Engineer

PRESIDENT 2009-2011

Professor John Campbell, OBE, FEng

## Chairman's Newsletter: December 2010

### Membership

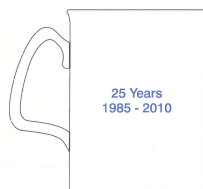
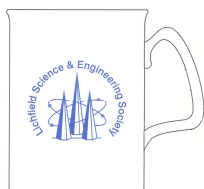
Sadly, I have to report that a member, **Mr Gordon Cracknell**, passed away in late September. On your behalf, I extend our sympathies to his widow, Valerie, and to their family.

**Can I remind** members that, when booking more than one event, you should send a separate cheque for each. This greatly aids our accounting and your cheques will not be presented before the relevant event. Thank you.

**In my report of the AGM** – and indeed to the AGM – I should have included as the second point of the new admissions policy that our first priority is fairness to members. It is increasingly members who pay for the meetings and your management committee felt that members should have first priority on seats. That is to say that no member should see a visitor admitted whilst they are excluded (in the case of a full house) simply because that visitor was accompanied by a member.

It was this last thought that lead us to the reported second principle of the policy. I apologise for any misunderstanding which may have arisen from this lack of completeness and clarity in my statement.

**Bone China 25th Anniversary Mugs!** Another reminder that 25th Anniversary celebration mugs are available for £5 each, £9 for two. They are very good quality – I use mine daily! So contact Bob Giles for further details or to purchase yours at any of our lectures. If you prefer, you may order by post at £9.00 for 1 or £15.00 for 2, inclusive of Post & Packing.



**Hearing Loops.** I believe that this system, which uses the 'T'-setting of some hearing aids, is now working well. However, I also understand that some performers' equipment does not work with the installed loop system so you may have difficulties in those circumstances. But not with our meetings!

If you have any problems, you can still borrow a headset from the Box Office and use their alternative system in the main theatre.

### Meetings

You may have noticed that our Programme for October was expensively amended, in both cost and committee members' time. This was due to a last minute change to the Garrick's Repertory season, due in turn to one of the stars becoming unavailable for the original plan.

The first meeting of the season, on **16<sup>th</sup> September 2010**, was well attended with 8 visitors, 99 members and 1 Student Member enjoying interval samples of apples and apple juice from trees in the National Fruit Collection at Brogdale Farm, Faversham, Kent.

The collection's Scientific Curator, Dr Matthew Ordidge from the School of Biological Sciences, University of Reading, instructed us on the different shapes and colours of apples and how they originated, not in England's green and pleasant land but in Asia! For thousands of years, they have been cultivated for their flavours and textures until now there are over 7500 varieties world-wide.

On **27<sup>th</sup> October 2010**, Professor John Campbell, President of the Society gave a wonderful presentation of The Science and Technology of Bell Founding to 132 Members and 29 Visitors. The casting of bells has a long history but some of its mysteries are being explained for the first time. Even so, these beautiful products remain exciting and rewarding, even sensuous for some it seems!

Chairman:  
Eur Ing Brian Hammond, DipEE,  
DMS, CEng, MIET  
6 Darnford Lane  
LICHFIELD  
Staffs. WS14 9RN  
Tel: 01543 252 693  
Brian@LSES.org.uk

General Secretary:  
Mrs M Sadler  
Ashton Hayes Farm  
Tuppenhurst Lane  
Armitage, RUGELEY  
Staffs. WS15 4HN  
01543 492 944  
Marion@LSES.org.uk

Hon. Treasurer:  
Mrs C Hannam, BSc  
52 Kensington Oval  
Boathouse Field  
LICHFIELD  
Staffs. WS13 6NR  
Tel: 01543 255 903  
Carol@LSES.org.uk

Membership Secretary  
& Deputy Chairman:  
Paul Bettson  
Tuppenhurst Farm  
Armitage  
RUGELEY  
Staffs. WS15 4HJ  
Tel: 01543 490 351  
Paul@LSES.org.uk



But there are difficulties in casting by the present methods, and not only for bells. The pouring of molten metals creates oxide layers which become folded into the solid, making weaknesses which result in cracks after a period of stressing. If only the industry would listen to John's instructions, they could save themselves so much money and heartache, not to mention warranty costs and unhappy customers!

**8th December 2010** saw Derbyshire engineer, Ian Crockford, Project Sponsor for the Olympic Stadium, Aquatics and Water Polo Venues, run through the design of and progress at the London 2012 Olympic site. The event was slightly marred for the 103 Members and 26 Visitors present by some problems with the technology but Ian was a true professional, refusing to be phased by the difficulties.

This 500 acre\* site, the largest construction site in Europe, has a budget of £8bn. It was heavily contaminated by many years of industrial use, necessitating the removal and washing of 800,000 tonnes of soil – enough to fill the Royal Albert Hall – before reusing it on site. There were also 192 buildings to demolish or relocate, one of these being particularly tricky as it was the famous supplier of London smoked fish since 1905, H Forman & Son.

The main 80,000 seat stadium is designed so that 55,000 seats and their supporting structure can be removed for reuse, leaving the lower 25,000 seats for almost any athletics, concert or theatrical event in the future.

The Olympic Village comprises apartments for 17,000 athletes and officials, restaurants, shops, medical, media and leisure facilities. After the Games, it will be transformed into 2,800 new homes, including 1,379 affordable homes.

However, the largest zone is the £355m International Broadcast (IBC) and Main Press Centre (MPC) to support the expected 23,000 broadcasters, photographers and journalists. Providing 50,000 sq.m. of studio space and 37,000 sq.m. of offices, plus a Conference Room for 800 journalists, a 'High Street' with facilities to serve 50,000 meals a day and outlets such as banks, newsagents, travel agents and a post office, it is designed to be divided and let after the Games.

\* 500 Acres is 0.78 sq.mile, 202 Hectares or 2.02 sq.km. (I've not quoted it the customary 'football pitches' since these can vary between 5,000 and 13,000 sq.yds, approx 1 to 2.7 Acres!)

### **Erasmus Darwin Memorial Lecture**

I have to report once again that our annual prestige lecture was a sell-out! I had a few tickets in excess of those required for our guests and was thus able to help a few members but

### **DON'T RELY ON IT! BUY YOUR TICKETS EARLY NEXT YEAR.**

On **16th November 2010**, 163 Students – a record – 208 Members and 108 Visitors comprised the audience for the 21st Erasmus Darwin Memorial Lecture "Genetic Fingerprinting: Past, Present and Future" by Professor Sir Alec Jeffreys from the Department of Genetics at the University of Leicester.

DNA fingerprinting, which he accidentally invented in 1984, has most notably revolutionised forensic and legal medicine and really caught on due to his use of that name. Sir Alec took us from that memorable date, through the development of DNA profiling based on minisatellites and then, because of Polymerase Chain Reaction amplification, microsatellites, leading on to the automation of the process. Finally, he outlined some of the legal cases involving DNA profiling, clearly favouring those which had cleared an accused.

### **Annual Dinner**

We were again at The Oat Barn, Packington Moor Farm, for our Annual Dinner on **5th October 2010**. The excellent meal, enjoyed by 94, was followed by a talk on his experiences in the job by our recently-knighted Patron, Sir James Hawley, KCVO, Her Majesty's Lord-Lieutenant of Staffordshire.

### **Discussion Luncheons**

With the recent controversial Intensive Dairy Farm application, Derek Loweth, NFU Group Secretary, will lead a Discussion on **Wednesday 23rd February 2011** on Intensive Farming.

### **Visits**

**22nd September**, CERAM Research Ltd, Stoke-on-Trent. The 33 members who enjoyed this visit were first greeted by Geoff Edgell, Director and Principal Construction Consultant, and then split into four groups to take different routes around the site, visiting -

Scanning Electron Microscope  
Flooring Slip Resistance Test  
Surface Science Laboratory  
Structures & Facilities Laboratory.

On the tour we learnt about the principles of the SEM as well as its use in detecting 'foreign' materials in, e.g. an Orthopaedic Implant component. There were two ways of testing for Flooring Slip Resistance, tilting it and literally walking on it and a more scientific pendulum test. In the Surface Science Lab we discussed integrated circuit bond pad integrity and the extent of fluoride penetration into tooth enamel. The Structures Lab turned out to be a huge building in which everything from water absorption of bricks to the aerodynamics of tower blocks is tested.



On **October 21st**, 40 members had a wonder filled visit to COSWORTH Ltd in Northampton. Starting from the ultra modern, spacious, octagonal reception facility, we were eventually enticed away from the various attractions - including a Formula 1 racing car, all sleek and shiny blue - to a warm greeting and liquid refreshments in the lecture theatre beyond.

Here, enthralling presentations by the Head of Communications Dr Szyjanowicz and the F1 Operations Manager Chris Jilbert, informed us about the early days of Cosworth and what it does now. Long associated with high performance engines and F1 racing, this still keeps them busy but only amounts to one-third of current business. Their markets now include Aerospace & Defence, Energy Generation, Marine, Motorsport and Performance Tuning Components. Capabilities include Design & Analysis Solutions, Engine Build & Test, High Performance Electronics and Precision Manufacturing.

We heard much about and examined various Cosworth engines, including one made for remotely controlled Military Drones, watched an engine test and saw pistons being made. We were allowed to handle numerous engine components, each a marvel of precision and finish, even a fluid-cooled alternator, no larger or heavier than a jar of jam!

A vote of thanks to our hosts was kindly made by our President, John Campbell. Appropriate as John is not only Emeritus Professor of Metallurgy at Birmingham University but he developed the revolutionary Cosworth Casting process for the firm some years ago. Many of you heard John describing this in his recent lecture to the Society on the Science & Technology of Bell Founding.

(I am indebted to Tim Sims for the above report as I was unable to join the visit.)

"Behind the scenes at the NEC" required two visits, on **11th and 18th November**, arranged with the help of member Riach Ryder, NEC Operations Director. Refreshments were provided on arrival and Riach greeted us, introduced our guides and gave us an overview presentation of the operation.

Opened by the Queen in 1976, The National Exhibition Centre (The NEC) is the busiest exhibition centre in Europe, staging some 160 trade and consumer exhibitions visited by over four million people each year. The 650-acre site holds 21 exhibition halls totalling 200,000sqm. The biggest exhibition centre in the UK, it generates over £1bn for the regional economy. Of course, it is helped by the proximity of the international airport and rail station, as well as having good motorway links plus three hotels and the LG Arena on-site.

The first visit gave us free previews of the Classic Car show - which was in preparation for the next day's opening - on the way to and from the various departments! All of the rubbish from the preparation of such stands and their subsequent tear-down, as well as that generated by visitors during the show, is collected and taken to their recycling centre, the first point on our tour. Here all of the waste is sorted (manually, it's not large enough to warrant mechanisation) and baled before being shipped out and sold for specialist processing. A far cry from the days of paying for it to go to landfill! Food waste will shortly be going to a biomass plant to generate electricity, too.

We then went underground, into the service ducts where the water, gas and waste pipes and the electricity, and communications cables are run to each stand as required. Like the clean-up of the exhibition areas, these services are often connected overnight for the next show, so tight are the schedules. On, then, to the control room, where the electricity being used by each stand can be monitored and even switched on and off.

Finally, to the security office where, we saw the images from the 130 CCTV and ANPR cameras displayed on banks of monitors. Also there are the consoles for contact with fire, police and ambulance services, as well as with all the NEC's own security staff, fire station and medical rooms.

The second visit might have seen the Design & Technology with ICT show, the only subject-specific Education Show in Europe helping teachers to plan, resource and implement the teaching of D+T in schools, which was running at the time. But no such luck!

Tim and Irene haven't been sitting on their hands, having arranged for you to visit John Deere UK, in Nottingham, the Highways Agency's National Traffic Control Centre in Birmingham and Ratcliffe on Soar Power Station also in Nottingham.

See Tim Sims' notices enclosed and get your applications in quickly as places are limited.

### ***In closing***

Our next meeting will be on **Wednesday 19th January 2011** in the Studio Theatre, where Mr Paul Chell, Immediate Past President of UKISCRS, and Miss Monique Hope-Ross, Consultant Ophthalmic Surgeon will discourse on "*Cataract surgery, past present and future*". I hope to see you there. Clearly!

In the meantime, enjoy your Christmas and New Year celebrations.

Brian Hammond  
Chairman