



# Lichfield Science & Engineering Society

PATRON

Ian Dudson CBE

H.M. Lord-Lieutenant of Staffordshire

PRESIDENT

Professor Rex Harris

FREng, FIMMM, FInstP, MIEEE

Dear Member,

It is with great sadness that I have to report the death of Past Chairman Paul Bettson. Paul died suddenly at home on Sunday, 23<sup>rd</sup> November 2014. Paul was an inspiration to us all as he worked tirelessly for this Society, nothing other than the best would do. Paul was determined that this Society would prosper and go from strength to strength - and it has. He served not only as Chairman but as Visits Secretary and Membership Secretary during his long committee tenure. The five hundred or so people attending Paul's funeral paid tribute to the man he was and the man we have lost. Our thoughts are with Robina, Tom and Melissa at this time and also with Rosa, Paul's mother.

## Monthly lectures

The September lecture was given by Society President Professor Rex Harris on 'Rare Earth Magnets, Hydrogen and Sustainable Technologies'. He considered ferromagnetics iron, cobalt and nickel and their use in commercial magnets before moving onto the Lanthanides or Rare Earths. Permanent magnets are getting smaller and smaller and are now usually an alloy of neodymium, iron and boron. Rex was concerned that when using his hydrogen decrepitation processes, the hydrogen desorbed is wasted. Magnets are revolutionizing modern life and are becoming an essential agent in decarbonizing energy production and energy consumption. Birmingham University has a hydrogen powered boat. There were 121 Members and 5 visitors present.

Dr Patricia Hunt from Imperial College, London delivered the October lecture. She kept 155 Members, 3 students and 5 visitors fascinated with her exploration of water and we realized very quickly that the properties of water are extremely complex and unique. The lecture began by making us explore the importance of water from our own experiences and then moved into a consideration of the dipole moments and molecular arrangements through hydrogen bonding of the molecules. We entered the realm of quantum physics and computer simulations before returning to more everyday characteristics. Her diagrams and simulations were wonderful and nobody seeing them could fail to understand the anomalous expansion of water upon freezing

The December lecture on Designing New Street Station by Carol Stitchman, Network Rail's Head of Design, was attended by 185 Members, 71 visitors including one student, and two guests from Burton on Trent and District Engineering Society, fortunately in the Main Theatre. Carol explained the design requirements of the building and the proposals put forward by the main competitors before she showed us what it will look like when finished. For many members an interesting sequel to our visit last January.

## The 2014 Erasmus Darwin Memorial Lecture

The 25<sup>th</sup> Erasmus Darwin Memorial Lecture was given by Professor Sir Colin Blakemore and he considered 'Evolution of the Human Brain: a tale of two Darwins'. After a technical hiccup at the beginning, which I can assure Members was not there at the end of preparations at 7.00pm, the lecture moved on a pace as Sir Colin considered the evolution and development of the brain and in particular the areas of the brain which respond to visual stimuli. The lecture was exciting, thought provoking and took us to the cutting edge of research. The theatre was sold out and it was particularly thrilling to have 149 students amongst the audience.

### Chairman:

**Carol Hannam, BSc**  
52 Kensington Oval  
Boathouse Field  
LICHFIELD  
Staffordshire WS13 6NR  
01543 255 903  
Carol@LSES.org.uk

### General Secretary:

**Marion Sadler**  
Ashton Hayes Farm  
Tuppenhurst Lane  
Armitage, RUGELEY  
Staffordshire WS15 4HN  
01543 492 944  
Marion@LSES.org.uk

### Hon. Treasurer &

**Deputy Chairman:**  
**Dr Bob Giles**  
11 Wyvern Road  
SUTTON COLDFIELD  
West Midlands B74 2PS  
0121 355 4594  
Bob@LSES.org.uk

Website: [www.LSES.org.uk](http://www.LSES.org.uk)



## Lichfield Science & Engineering Society

### **Discussion Lunch**

Twenty Members and guests attended the 16<sup>th</sup> Discussion Lunch on Thursday 5<sup>th</sup> September. 'Scientist of the Invisible: the life of Rudolph Steiner – educationalist' was led by Brian Teall, and we are most grateful to him.

Brian described Steiner's religious philosophy and way of life. He explained the principles of education through fun and a study of one topic for six weeks. Unlike in normal schools, children enjoy being taught by one teacher for their junior school years, making lasting friendships and relationships. There followed a lively discussion, as you would imagine.

### **Annual Dinner**

The Annual Dinner took place on 22<sup>nd</sup> October at Aston Wood Golf Club with 122 Members and guests attending. We were graced with the presence of our Patron, H.M. Lord-Lieutenant of Staffordshire, Mr Ian Dudson and Mrs Dudson. Also in attendance were our President and Immediate Past President with their partners. We enjoyed a hearty meal followed by a vibrant lecture given by the accomplished speaker Dr Turi King who described the process of finding, examining and experimenting upon the skeleton found in Leicester until its certain identification as Richard III. Three people know the whereabouts of the remains, including Dr King. One of the team was heard to remark that should any misfortune befall all three before Richard's re-interment we should be left looking for Richard's remains for another few hundred years!

### **Visits**

The April visit to Birmingham University was oversubscribed but Drs Olatunbosun and Clay kindly offered us an opportunity in July for a second group to visit respectively their Automotive Engineering Department and Visualisation Centre. Remi again showed us their work on advanced engines, the Department's car entered in the Formula Student Championship and the Advanced Machining Centre. Richard showed us even more ingenious ideas for using modern computer, phone and screen technology to display the vast amounts of information held in Museums and Libraries, and described the effects these have on the behaviour of users.

Wednesday, 17<sup>th</sup> September saw 19 Members at Hemel Hempstead at the BSI laboratories at Kitemark House. Tests are carried out for National, European, International, Foreign and Publicly Available Standards. We saw fire alarms, smoke alarms, playground surface impact and helmets being dropped with model heads inside. In the Respiratory Lab. we saw masks from simple dust masks to those used in chemical, biological, radiological and nuclear environments being tested. One operator was filling a chamber with a 1.0% concentration of sodium chloride mist and recording a penetration of the mask with sodium ions at 0.000837%. Finally we watched Jeff. Jeff the robot who opens and closes a door, locks and unlocks it 50,000 times in 4 days!

On the 20<sup>th</sup> October 20 Members went to Airbus at Broughton to see the construction of the wings for the A380 which are made in pairs in a purpose built building and demonstrate a huge engineering design which includes fuel space, landing gear and engines. The five wing sections for each surface are fixed together vertically in a jig. Construction takes 84 days then they are taken by barge, ship and road to Toulouse where they meet up with the fuselage and rest of the aircraft.

In November and December two groups visited the factory of Cooke Optics in Leicester. Cooke have been producing cinematograph lenses for 120 years and some of their polishing machines were built in 1914 but they are widely regarded as being among the top three manufacturers in the world. The demands of users are extraordinarily exacting. Lens blanks are rejected for flaws measuring as little as 2 microns and the focussing ring is engraved only after the exact focussing positions have been measured. Perhaps all this care accounts for the Technical Oscar the company won and for the eye-watering selling prices.

There are more visits planned for the Spring Term and you should respond to the forms enclosed with this mailing as quickly as possible. If you have applied for a visit please note that the Members' Area of the website will show when details have been sent out.



## Lichfield Science & Engineering Society

### **Membership and Subscriptions**

The Treasurer, Bob Giles, wishes to say thank you to all those members who renewed so promptly in August, ready for the start of our lecture programme, and for the generous donations to our Education Fund. Reminders will be sent out in December for those who have not yet paid and we shall delete from the database those members who have not paid by the beginning of January.

### **School lecture**

We have decided to hold the School lecture in the Garrick Studio for the first time. It will be given on February 4<sup>th</sup> at 7.30pm by Mr Richard Bryan MBChB PhD MRCS PCTM, Senior Research Fellow, School of Cancer Sciences, University of Birmingham. Richard will provide An Introduction to Cancer & Cancer Biology.

Although tickets are free to students they must still be booked via Jenny Arthur, Education Officer.

### **Lastly**

In closing I should like to thank your most hard working committee. Neither the Society nor I could manage without their dedication, determination and attention to detail. The Members make the Society and we, the committee, are grateful that there are so many enthusiastic Members who support all that is put before them.

May I wish you all a truly peaceful Christmastime and a New Year that finds you happy, healthy and able to step out smartly towards '3D Printing: Unlocking the Potential' on Wednesday 21<sup>st</sup> January – see you there.

Carol Hannam  
Chairman