



# Lichfield Science & Engineering Society

PATRON

Ian Dudson CBE

H.M. Lord-Lieutenant of Staffordshire

CHAIRMAN

Paul Bettson

PRESIDENT 2011-2013

Professor Sahar Al-Malaika

BSc PhD CChem, FRSC, FIMMM

## WELCOME

Welcome to the April Newsletter and annual report. Membership continues to be strong with 346 paid up members.

## PATRON

During the autumn Ian Dudson CBE accepted our offer to become Patron. Ian is Chairman of the Stoke-on-Trent based ceramics manufacturer, Dudson Ltd. which has been in the family for nine generations. Ian is a former trustee of Lichfield Cathedral and is Chair of the Trustees of The Dudson Centre, which acts as a resource centre for voluntary groups. He has served as a Deputy Lieutenant for the last decade and was awarded the CBE for services to the ceramics industry in 2002. Ian lives near Stoke-on-Trent with his wife, Jane, and has two daughters.

## MONTHLY LECTURES

January's lecture was given by Professor Kevin Warwick on the subject of Biological Brains for Robots. His presentation looked at how the use of implant and electrode technology can create biological brains for robots, enable human enhancement and diminish the effects of certain neurological illnesses. This has already had a profound effect in several areas, a key element being the need for a clear interface linking the biological brain directly with computer technology. The emphasis is placed on experimental scientific studies, notably on the need for a biological/technological connection to link directly with the cerebral cortex and/or nervous system. The presentation looked at a future in which robots have biological brains and in which neural implants link the human nervous system bi-directionally with technology and the internet.

In February, in a change to the advertised lecturer, Mark Hemsell, Future Programme Director for Reaction Engines Ltd gave us a fascinating insight into Bridging the Gap between Earth and Space. Reaction Engines Ltd is a UK company formed in 1989 to develop the technologies needed for an advanced combined cycle air-breathing rocket engine class, called Sabre that will enable aircraft to operate at up to five times the speed of sound or fly directly into Earth orbit.

The company is in the early stages of developing Skylon, an unpiloted, reusable spaceplane intended to provide reliable and cost effective access to space which will be capable of transporting 15 tones of cargo. The Sabre engine will enable the vehicle to take off from a runway, fly direct to earth orbit and return for a runway landing, just like an aircraft, with an order of magnitude reduction in cost versus existing technology.

In March Dr Jeremy Tomlinson from the Centre for Endocrinology, Diabetes and Metabolism at the University of Birmingham, gave us a detailed insight into Diabetics and Obesity. He enlightened us on the Obesity trend, following the pattern in America where a significant

Chairman and  
Membership Secretary  
Paul Bettson  
Tuppenhurst Farm  
Tuppenhurst Lane  
Armitage, RUGELEY  
Staffordshire WS15 4HJ  
Tel: 01543 490 351  
Paul@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:  
Dr Bob Giles  
11 Wyvern Road  
SUTTON COLDFIELD  
West Midlands B74 2PS  
01213 554 594  
Bob@LSES.org.uk

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

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



proportion of young people are obese and hr talked about the related health problems associated with it. It appears we are sitting on a time bomb!

Our April lecture was delivered by Dr. Tim Grant on the subject of Developing Investigative linguistics as a Forensic Science. Tim has worked on criminal and civil cases in the UK and overseas and has given evidence at Crown Courts including the Old Bailey, at courts martial in the UK and Germany and in civil hearings. In the criminal field he explained how he had worked as an investigative advisor and provided expert evidence in numerous cases involving terrorist conspiracy, murder and stalking. He is an expert on text and other electronic messaging services and gave examples of evidence gained from a murder inquiry.

The lecture totals for the year are as follows:

15 May 2012	Abnormal Load Eng & AGM	131
12 September 2012	A second Green Revolution	134
11 October 2012	Bringing Social statistics to life	129
13 November 2012	Great Ideas in Biology	556
12 December 2012	Structural Engineering of the Shard	193
24 January 2013	Biological Brains for Robots	131
19 February 2013	Bridging the Gap from Earth to Space	133
13 March 2013	Battling Diabetes in the 21st Century	150
11 April 2013	Forensic Linguistics	140

### **THE 2012 DARWIN MEMORIAL LECTURE**

As reported in my December Letter 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**

As I reported previously the annual school's lecture took place on Monday December 3rd 2012 when Sir Alec Jeffrey's 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.

### **THE 2013 DARWIN MEMORIAL LECTURE**

The 24<sup>th</sup> Erasmus Darwin Memorial Lecture will be given by Professor Tony Ryan, Pro-vice Chancellor of the Faculty of Science & Professor of Physical Chemistry, The University of Sheffield on the subject of "Project Sunshine".

The event should prove popular so please buy tickets early to avoid disappointment. As usual they are on sale at the Lichfield Garrick Box Office, from Wednesday **24<sup>th</sup> April for LSES Members at a special member's price of £10**. This is a week before general release to the Public.

Project Sunshine tells the story of how scientists are working to reconnect us to the 'solar economy', harnessing the power of the sun to provide sustainable food and energy for a global population of 9 billion people: an achievement that would end our dependence on 'fossilised sunshine' in the form of coal, oil and gas and remake our connection with the soil that grows our food. It is an astonishing fact that capturing all the energy in just one hour's worth of sunlight would enable us to meet the planet's food and energy needs for an entire year.

### **DISCUSSION LUNCH**

The 13<sup>th</sup> Discussion Lunch was held at Darwin House on Wednesday 6th March where Carol Hannam and Jenny Arthur led the discussion on the subject of 'Gene mapping for all?'. This led to spirited interaction from attendees after a delicious lunch. Our thanks to Carol and Jenny who were ably assisted by Rod and David.

### **THE ANNUAL DINNER**

Last 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.



## EDUCATION FUND

Requests for assistance from the Education Fund are considered in January and this year we made the following donations:

Henry Chadwick, Hill Ridware	£160.00	
Chadsmead Primary Academy	£200.00	
Chase Terrace Tech College	£200.00	
Lichfield Library	£100.00	Materials for school visits in Sc week
Erasmus Darwin House	£140.00	Materials for school visits in Sc week
	£800.00	Total

150 Children visited Darwin House for the Science Day on March 16<sup>th</sup> where Jenny Arthur had co-ordinated several displays. Linda Death, Jean and Paul Norris and Pete Stubbs all helped with photography experiments and light box displays. James Howells gave his fascinating electric show, and John Hindhaugh helped children make mechanical birds.

Letters of thanks and appreciation have been received from all donees.

## VISITS

During February 22 members visited Smiths of Derby, a 150 years old clock making company, renowned for its manufacture of exterior public clocks. Clocks installed by Smiths include the clock in St Paul's Cathedral and St. Pancras Station as well as many iconic public clocks around the world; exporting to 50 countries. The company still maintains many of the cocks it has installed around the world, and indeed this is a major part of the business. In a fascinating presentation we learnt that Smiths clocks are seen by 24.6 million people each day. The company manufactured and installed a clock for the Sultan of Oman based on a London Big Ben design, as well as a bespoke design for the Queen of Tonga. On our factory tour we saw the diverse range of clocks they build and restore. In the test area two large church clocks were being evaluated before dispatch. Restoration is a significant part of the business with many of the original skills being preserved. Gold leaf is still used on some clock faces, which we saw being applied. Today most clocks are electric and we saw the various modern electric mechanisms which Smiths have developed.

Two separate visits in March allowed a total of 38 members an eye-opening opportunity to see John Lewis' Distribution Centre in Milton Keynes. Their 65000 sq.ft. warehouse contains not only 125000 lines of merchandise but also ten miles of conveyors and automatic high lift pickers reaching into 35 ft high racks, sending items to the packers instead of people going around fetching them. The building is designed to allow maximum daylight, making a pleasant working environment and JL gave every sign of living up to their reputation as a responsible and caring employer. Lewis's are so pleased with the facility that they are building another one next door, in order to cope, not only with supplying their stores but also with the ever-growing on-line business.

## IN CLOSING

My thanks go to the committee for all of their hard work in organising the events and keeping the administration running smoothly, without such a stalwart committee the Society would not be the success it clearly is. Also many thanks to Sahar and her husband Sam, who have supported us at numerous events in addition to the various formal occasions during the year.

Paul Bettson

Chairman



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Engineering Society