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Lichfield Science & Engineering Society

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Dear Member,

April 2020

Greetings from a socially distancing Chairman. Thank goodness the weather has been sunny for the past days, but today (Sat 18th) it is raining so I can get round to completing my Spring newsletter.

This Spring Newsletter summarises the past 4 months of what has been a very successful year for lectures and social events. I hope it reminds you of times happier than at present! The LSES programme as well as our lives have been disrupted by the Covid-19 pandemic, our lectures in April and May have been cancelled and we cannot hold an AGM. Our June lecture and Summer Supper will not take place. Each of the lecturers has agreed that they will give their lectures at a later date.

At present we are assuming that the Garrick Theatre will re-open in time for our programme starting in September to take place. We are planning to circulate the 2020-2021 programme, details of the Annual Dinner and Erasmus Darwin Memorial Lecture and Autumn Visits with the membership renewal letters in late July. Let us hope this is possible.

Our financial year finished on 30 March 2020. At the last AGM we reported that the costs of using the Garrick Main Theatre had increased considerably. The facilities of the Garrick theatre are excellent and suit LSES well, but they cost much more than they used to. The Erasmus Darwin Lecture in the main theatre was not well supported by the general public which is a pity since the lecturer the Deputy Chief Medical Officer for England and the topic "Global Pandemics" could not have been more relevant to the situation we live in today. Audience numbers were down, costs were up, the topicality of the lecture is very striking and is ironic that it has led to a large loss of £1609.52.

Finally, at the previous AGM, we promised to increase our spend on supporting education of young people in science and engineering. We made two education grants totalling £1833.34 and many smaller awards.

The excess of Expenditure over Income totalled £3979.56. But as you all know we are in a strong position financially, thanks to good management and we are well able to meet our expenses but we must deal with this for the future.

Lectures

9 January 2020, "Historic Environment Strategy for HS2" Dr John Halstead, Manager of the Strategy for Historic Environmental Research and Delivery for HS2 Phase 1 (HERDS).

The planning authorities now require a full archaeological survey of the damage which will happen during construction of major projects. HS2 will build 200km of track and surroundings as a corridor from London to Birmingham.

John explained the strategy which will be followed in order to explore the archaeology of prehistoric, Roman and later periods, examining such heritage as farming methods, railway and industrial technology.

A careful paper study of the known heritage of the route has been undertaken to alert the construction teams on what to expect and this has been expanded by exploratory digging in known sites of interest. Much of the construction has not begun so there is little new information yet but full records will be kept of the new history and will be published. It was suggested from the audience that a museum could be set up.

It was attended by 154 members and 6 visitors.

11 February 2020, "Sharp Knives: The Blunt Truth" Professor Sarah Hainsworth. Pro Vice Chancellor of Aston University.

Sarah started her lecture by telling us that 11 February was Women In Science Day and she said it was for all of us to promote girls in engineering which has excellent career prospects.



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Knife crime is widely reported and increasing, but knives are carried by a tiny minority and most crimes are either domestic or involved with drugs and mostly for threatening. About 40% of criminal deaths are due to knife crime. The UK is relatively crime free compared to gun crime in the USA where guns are widely available.

Small kitchen knives with sharp points are readily available and there has been a campaign to use knives with square and rounded tips. Sarah's research has revealed just how small is the force required to penetrate the body with a knife, The research compares the force involved in a punch or a push or a slap; for a sharp knife penetration is easy whilst those with blunt tips require much more force but still within the capability of most people if determined enough. Kitchen knives are used for cutting with the blade and do not need a sharp point. Following Sarah's research Viners have just brought out a range of kitchen knives with rounded tips and it is hoped other manufacturers will follow.

Sarah was also involved with Richard III's death. With high resolution tomography 3D scans of the skull showed that a blade had gone through the brain from below leaving an indent on the inside of the skull, there were several other injuries after his helmet had been removed. After much controversy it was decided to re-bury Richard III in Leicester close by where he was originally found.

Finishing Sarah showed us a video aimed at young people to promote a career in engineering.

It was attended by 102 members, 3 visitors and 3 members of Burton upon Trent Engineering Society

12 February 2020, Schools Lecture, "Obesity and Diabetes: The Health-Wealth Paradox", Professor Cliff Bailey, Aston University.

In a lecture both to students and to members of LSES, Cliff showed us how the benefits of improved health, wealth and extra nourishment have resulted in an increase of Type 2 diabetes-

Measures such as Body Mass Index (BMI) show how the nations of the world have increased in weight since measurement began in 1970, however BMI takes no account of the distribution of weight, so waist measurement is now regarded as a better check of obesity, waist measurements increase to our detriment. Excess fat around our stomachs, as well as increasing the risk of diabetes, also increases the risk of strokes, heart disease and certain types of cancer. The UK ranks as the country with the highest level of obesity in Europe, more than 1 in 4 adults are obese and 2 out of 3 are overweight. Nearly one third of children are obese

While our food intake has increased, the resulting obesity is known to trigger changes in the production and use of the hormone insulin which helps sugar uptake into cells. The good news is that a 5% reduction in body weight followed by regular moderately intense exercise could reduce type 2 diabetes by 50%. Treating obesity and diabetic complications such as amputations is becoming very costly to the NHS and is an unsustainable drain on NHS resources,

Cliff not only advocated portion control for us all as an easy way to reduce our food intake, he didn't even have supper with us beforehand!. It is a great shame this lecture was not recorded; it was excellent.

This lecture was attended by 24 members and 54 students.

10 March 2020, "Demystifying Artificial Intelligence" Dr Paul Taylor, BT.com

Paul's lecture certainly told us what AI was and how it had been developed over the past 60 years from simple statistical analysis to complex route planning. Without our realising it, this computer analysis has become integral to our lives and it was good to see his examples of where it is of benefit to BT.com.

The distinction he made that machine learning from huge sources of data was the next step in AI as it enabled us to realise how difficult it is to mirror the human brain in making judgements required in driving and medical analysis and facial recognition. He cautioned us about how "successful" these technologies are and we were all warned not to believe all the hype!

This lecture was attended by 116 members, 7 visitors and 8 students



7th April 2020, “What Can Quantum Sensors Do for you”, Professor Kai Bongs, University of Birmingham

Unfortunately due to the Covid19 pandemic this lecture had to be postponed, and it has been rescheduled into the 2020-2021 programme.

6th May 2020, “Thunderbolts and Lightning. Are they Really very Frightening?”, Rhys Phillips, University of Cardiff. Preceded by LSES’ AGM

This lecture has been rescheduled in the 2020-2021 programme. The AGM will be held at the next available date, at least 14 days notification will be given to members

Discussion Lunch

19 February 2020: Discussion Lunch “Packaging”

Starting at 1pm, 24 people enjoyed a delicious lunch, with superb sweets and a glass of wine (some had fruit juice) cheese and coffee and finally got to the discussion about 2:15.

Keith Barnes, who had held senior positions in a lifetime in the packaging industry, had prepared a short introduction for those present and questions and answers and discussion soon followed. Whilst the trend is to move away from plastic packaging, alternative materials may actually have a higher carbon footprint.

Unfortunately most packaging goes to waste and recycling is a major problem. Within the UK there is no agreed system of recycling the many components. Neither is there much training available for technologists in packaging, it just seems to be decided on a lowest cost basis. At about 3:15 the discussion had to be “wrapped up” after a very enjoyable event.

Visits

Visit to the Energy Innovation Centre, Warwick Manufacturing Group (WMG), Warwick University on Thursday 27 February

20 members were treated to a fascinating and detailed tour of the laboratories and engineering workshops at WMG. The Centre is a national facility for battery research, covering R&D from materials and electrochemistry, through to application integration and recycling/reuse.

We were shown the manufacture of Lithium batteries, both pouch and cylindrical cell fabrication and module and pack designs. Car manufacturers continue to have their own preference of design, some following the pouch route and others the cylindrical cell design. We were also shown around the “process scale-up” laboratories, where we could see the mixing of the various materials, coating and assembly.

19 March 2020, Visit to Newby Iron Foundry, Wednesbury.

28 April 2020, Visit to Lichfield Canal Restoration Trust, Birmingham Road to Fosseway Section.

Both these visits had to be postponed, it is hoped to reschedule them in the 2020-2021 visits programme.

Future visits are all on hold at the moment.

Julie and I are self isolating along with the rest of the nation, so far we are in good health and sincerely hope that all our members are too. Please take care.

With very best wishes for an end to this cruel pandemic

Bob.