

The Worshipful Company of Engineers
(Incorporated by Royal Charter 2004)
THE SWORDSMAN
Issue 36 May 2016



In this my last edition as Editor of Swordsman, it is my sad task to mention the passing of three notable people who were spouses of liverymen.



Robin Hulf husband of Master Elect Isobel died on the 12th November. Robin's funeral was held on Thursday 3rd December 2015 at Mortlake Crematorium and afterwards at London Rowing Club. His Memorial Service was held on Monday 29th February 2016 at

Southwark Cathedral and afterwards at Glaziers' Hall as Robin had been a liveryman of the Worshipful Company of Launderers. Robin was very much looking forward to supporting Isobel in her Master's Year and in this capacity addressed the Partners' Lunch in a speech read out by Master's Lady Christine O'Reilly (See Page 4.) Isobel would like to thank all those who have added to the contributions already made in Robin's name to The Anthony Nolan Trust which now exceed £11,000.

Lyn Cooper, wife of Court Assistant Dave Cooper died on 15th November 2015 after a long and very brave battle against breast cancer. Lyn's funeral was held on the 7th December at St Marys Church - the Parish Church of Eastbourne, followed by Afternoon Tea at The Grand Hotel, Eastbourne.



Dave wrote of her "Lyn was a great supporter of Dave in his role as a court assistant and attended most events with him. Her favourite event by far was the annual Carol Service which was one of the last events she attended about a year before she passed away. She also loved the Annual Banquet at the Mansion House and was a great host bringing many friends and family members to the event. An accomplished shot, having been part of her county team in former years, she was a member of the first team the Engineers entered into the annual inter

livery shoot at Holland & Holland in 2013. Sadly when the cancer spread into her bones she was no longer able to cope with the recoil from a shotgun and had to give the hobby up. Despite her illness she was always laughing and was good company to be with and will be remembered for her love of life and continual smile."

Winifred Mitchell died on 15th February 2016. Winifred was the widow of David, Master Engineer 1998-9 and was very supportive of David and the Company. Past Masters Cousins and Skinner wrote "Their out of Town Meeting



in Portmeirion set new standards of sophistication and comfort for the Company's weekends away. David started the Swordsman Magazine shortly after his Master's Year which Winifred read avidly right up to her death. Her funeral in Little Missenden Church in Buckinghamshire was held at exactly the same time as the Memorial Service for Robin Hulf.

The Company was well represented at all three funerals.

Two liverymen Nick Hargreaves and Cecil French passed away and these are remembered in the Obituaries section on Page 30.

PARTNERS' LUNCHEON Thursday, 20th October 2015

Sue Hewerdine set the scene: "It was a lovely autumn morning as we hurried into the Royal College of Surgeons, but we had been travelling since 7.30am that morning and we were in need of just two things – a visit to the Ladies and a cup of coffee! After having satisfied one objective we went in search of the rest of our party and joined everyone for coffee in a room with fine panelling and a selection of august portraits of Presidents of the Royal College of Surgeons.

Whilst we were enjoying our coffee Wing Commander Surgeon David O'Reilly, the son of the Master Engineer and his Lady, gave an insight into the history of the Royal College of Surgeons

and its connections to the Hunterian Museum. John Hunter is recognised as the founder of scientific surgery and his magnificent collection of more than 15,000 preserved specimens of parts of both animal and human bodies, which were entrusted to the College by the then Government in 1799, forms the basis of the Hunterian Collection. Surgeon Wing Commander O'Reilly gave a graphic account of earlier surgery, where the surgeon was often as much at risk of dying as the patient.



After coffee we were given a tour of the Hunterian Museum by David and the curator of the Museum. The collection is beautifully housed and lit and endlessly fascinating. The specimens are preserved mostly by the 'wet' method in formalin and

require constant attention to ensure their survival. Hunter was not above using unorthodox methods to procure his specimens, indulging at one point in a little bribing to obtain the body of Charles Byrne, the Irish giant, whose skeleton is on display. The Museum is a lively place, as on the day of our visit, there were many school children and students busy sketching the exhibits and exploring.

Before we began lunch the Master's Lady read a letter from Robin Hulf, husband of the Senior Warden, Professor Isobel Pollock-Hulf, where he expressed his regrets at being unable to join us that day due to illness. The Master's Lady on behalf of all the ladies wished him well. It was an excellent lunch accompanied by a lively buzz of conversation and laughter. After lunch Jane Easton, Director General of the English Speaking Union gave an insight into the work undertaken by the Union in promoting public speaking and an appreciation of the English Language throughout the world. The Union endeavours to build skills and confidence in communication and thereby give the opportunity for people to realise their potential through the use of the English Language. It also has many local branches where programmes of talks and debating competitions are organised. The vote of thanks to Jane was

given by Mrs Janet Groome, the Middle Warden's Lady.

We thoroughly enjoyed our day visiting the Royal College of Surgeons and would love to go back to spend more time marvelling at the array of unusual, wonderful, bizarre, but all strangely beautiful exhibits.

Sue Hewerdine

As mentioned in Sue's article, Robin Hulf was unable to attend the luncheon due to illness but he sent a message which Christine read out:

"Master's Lady, former Masters' Ladies and Ladies, first and foremost may I apologise most sincerely for my absence today and I do hope that you will not mind if Christine reads my few words.

I regret to say that I cannot be here because I am still recovering from fungal pneumonia thanks to the excellent medical team at Kings College Hospital. It does mean that I am very weak and I am very constrained in what I can do and it will take some time to get my mobility back.

It is therefore very apt that you are meeting here in the Hunterian Museum which is full of historical medical artefacts. I would have looked forward to hearing Wing Commander David O'Reilly's introduction. I know that Isobel was most impressed with the visit organised by the Master's team to the Blast Injury Centre at Imperial College. There they are at the forefront of medical research and yet there was also an interesting talk illustrating how we can still learn many things from history.

For me personally The Engineers Company has been a real pleasure. I have been made so welcome and enjoyed making new friends. The Company carries out very important work and should be proud of its achievements.

I am immensely proud of Isobel's achievement and will be beaming from ear to ear when she is appointed Master next April. My role will be to support her to the best of my ability, which I intend to do.

The Swordsman

This leaves me to say thank for listening to me via Christine. Do enjoy your lunch. Best wishes to you all and I look forward to seeing you soon.”

The Master's Lady introduced her personal guests who included her son David who had spoken about the Hunterian Museum, his wife Donna and other daughter-in-law, Beverly. The Master also thanked the staff of the Royal College of Surgeons for their museum guide and their caterers and Katy, the Clerk's secretary and Events Coordinator, for all her help in organising this event.

Christine expressed how very privileged she and Pat were to be representing the Company which had given them the opportunity to attend some very exciting events. She raised many smiles when she recounted how David, her son, wearing his full Wing Commander's mess kit, had been loudly cheered by a hen party when he boarded a train at Central Cardiff as they thought he was the stripper come to complete their evening! After seeking the forgiveness of 'the token males' present, Christine spoke of the importance of the friendship of other women in women's lives. By way of example she said that her friend Alex, who was also a personal guest, had been a member of a small group of friends who had provided friendship and support to her. For 55 years, and with hardly missing a week, she and Alex had spoken over the telephone when they put the world and their husbands to rights. Apparently the conversation would on occasions veer to the philosophical, wondering why it takes a million sperms to fertilise one egg. They concluded it is because being male they are all too proud to ask for directions!

Christine said how very proud she and Pat were of their four granddaughters and grandson. Hugo carries the family's great hope for the next generation's engineer as he spends his whole life dedicated to trains. As for the granddaughters, Christine opined that wherever life takes them it will be in no small part due to the generations of women who got women the vote, equal pay and smashed those glass ceilings.

The Master's Lady then introduced her Speaker Jane Easton who is chairwoman of the English Speaking Union having previously worked in

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leadership roles with the Arts Council, the NHS, in universities, with the Church of England, and at the RAF Association, which is where she met the Master and his Lady.



Jane Easton described herself as an 'all-rounder.' Creating opportunity, education, widening horizons, social mobility and the power of communication had been central themes in her work and her life.



Jane spoke about the history and role of the ESU starting after the First World War when Evelyn Wrench, its founder, vowed to make a lasting contribution to peace between nations as a bridge between people of different continents, cultures and histories. The ESU is a membership organisation and an international educational charity, dedicated to the concept of international dialogue.

The first students enjoyed exchanges between British and American boarding schools. In the 1930's, up to 30 British students annually crossed the Atlantic for an academic year in schools across America. There was a similar exchange, US to UK. These days, the brightest students who make the same journey receive scholarships if they come from less well-off families. In a world where travel is now commonplace the role of the ESU is to seek out those who would benefit but do not have the means.

Internationally, the English-Speaking Union has over 50 member countries. Jane stressed that the ESU does not teach but does encourage school children to hone their English skills through what she called 'persuasive speech'. Debating is an extension of that art.

Today, the ESU begins speech and debate training in schools in less advantaged areas under the banner 'Discover Your Voice'. The aim is to engender confidence in the pupils. Jane was proud of the fact that ESU alumni have gone on to be QCs, politicians, captains of industry and impressive leaders. Among the alumni she was able to name drop eminent politicians, musicians, actors and broadcasters.

The ESU's Lindemann Trust Scholarships are for post-doctoral scientists to carry out research in the USA. (Lindemann, was Churchill's scientific adviser during the Second World War). Current scholars include a metallurgist working with solar energy applications and a chemical engineer working on nano-materials.

The shadow of Winston Churchill has been important to the ESU not just because he was an early Chairman of the ESU but has also provided inspiration for public speakers throughout the ESU's history. One of Churchill's legacies has been his method of preparation for a speech. After a disastrous speech in the House of Commons early in his career when famously he lost his train of thought, he vowed always to prepare. In the Churchill Archive, at Churchill College Cambridge, which is a partner for UK schools public speaking competition, there are meticulous manuscripts, typed, indented to be easy to follow, with last minute edits in red pen. Endlessly rehearsed to perfection, therefore making such a powerful impact as to be quoted with regularity, even now, 50 years after his death.

The ESU's International Public Speaking Competition, draws young people aged 16-20 from over 50 countries to compete in London for international recognition. They are the best of approximately 400,000 competitors worldwide. Jane highlighted that as the Chinese Premier was in the UK on a state visit and about to address Parliament, that the ESU has just begun to work in China with teaching the teachers to have the confidence to entertain the *idea* of debate.

ANNUAL LIVERY BANQUET MANSION HOUSE Friday, 30th October 2015

We are reminded every year about the special privilege afforded to our Company of being invited to hold our Annual Banquet at the Mansion House. Those attending this year's event, with or without guests, experienced again what this really means. From the personal welcome offered by the Master and Wardens as each passed down the Greetings Line, into the Salon for a sparkling wine reception, to the dinner and

speeches, all was to the highest standard which makes this particular event merit the description of “Annual Banquet.”



We were particularly fortunate this year to have the full top team of Lord Mayor, and the Aldermanic and non-Aldermanic Sheriffs and their consorts. But in addition we also welcomed to our top table our Ward Alderman, the Lord Mountevans, Jeffrey with his wife Juliet, shortly

before he assumed the office of Lord Mayor on the 8th November 2015.



The Master’s Speech

It is my great privilege and pleasure to welcome you all to the Mansion House for our Annual Banquet. Indeed, for this the most important event in our Livery's year, it is a privilege for us all to come together in your home My Lord Mayor and I thank you most warmly for making us so welcome here in the magnificent Egyptian Hall. We have had a most delightful evening, due in no small part to the excellent food and wines served so impeccably by the Mansion House staff. Also, and notwithstanding the fact that they have just withdrawn, I must thank The Live Brass Quintet for again entertaining us so royally.

I thank too our gallant and learned clerk, Tony Willenbruch who, with the very able assistance of



our new Secretary, Katy Moroney, has confounded Grundy’s Law. Steve Grundy our Assistant Clerk and Beadle retired in May after 27 years - we wish him well, but are delighted to find that a banquet can in fact be run without him. I am particularly grateful to Katy for coming up to speed so quickly and also, on this special occasion, to Mr Peter Thompson, for being our exemplary Beadle, supported by Jon Murrell. And this is indeed a very special occasion as we are enjoying tonight the equivalent of going on safari and spotting all of the Big Five on the first day! Tonight for the first time in many years we have the Big Three at our Banquet. We are not only delighted that you My Lord Mayor, together with Lady Mayoress Gilly, are gracing our table but that you are flanked by both of the City Sheriffs. More of the sheriffs later, whom we wish every good fortune as they embark on their challenging year, while you are within two weeks of completing a most successful term of office as the 687th Lord Mayor of London.

In this year celebrating Magna Carta and the special status conferred on the City by King John, you have led with distinction not only in your support and promotion of the City as the world leader in international finance and business services, but in the charitable and compassionate

aspect of your role which you and Gilly feel is so important. It is of course in the blood, your grandfather Sir Alfred Yarrow being a famous philanthropist as well as a renowned engineer and industrialist. The Lord Mayor's Appeal has been outstanding, and your motto "creating wealth, giving time, supporting people" has exemplified the three things at which the City excels – it has really caught on and galvanised our citizens. Perhaps the best example was last month's City Giving Day to which over 200 companies, large and small signed up and promoted their community work - alongside many of the beneficiaries of their projects – in an inspirational demonstration of the value of the City to Society.

You are not of course alone in all this and the Lady Mayoress dived into the deep end: taking part in the City Dip, swimming 5,000 metres and raising £14,000 for Mencap and Scope, the two principal charities of this year's appeal. By no means over, we wish you a fantastic Bonfire Night with your "Back to the Future" final event of the year's appeal next week on the 5th of November.



In his speech five years ago, Past Master John Robinson observed that the global economy, the Country and the City were in a difficult place and that we faced a number of tough years. He was not wrong but much progress has been made My Lord Mayor under your leadership and that of your recent predecessors. Reforms and rebalancing are taking place and the growth in economy from a post-crisis low owes a good deal to the traditional strengths of the City. The success of the recent visit by our new best friend, Premier Li Keqiang of China, and the promise it holds, results in no small part from the ground-

work done by this City. But there are still enormous challenges and every time it appears the stables have been cleansed, a new scandal emerges: with fresh accusations of rate and market rigging in foreign exchange, precious metals and liquidity auctions.

But engineers are now playing our full part in taking the spotlight off the banks and financial institutions - with a block buster scandal of our own. The manipulation by Volkswagen engineers of control software to dishonestly represent the emission performance of their diesel engines is a fraud right up there with the worst of the PPI and Libor fixing deceptions. As a profession, we should be embarrassed, not to say ashamed, and while I would hope this will prove an isolated case, it may not be so. This is a great pity as recent achievements and the growing appreciation by the public and media of the role, and indeed meaning, of professional engineer is transforming out-of-date perceptions of engineering. Two out of the four most recent appointments by the House of Lords Appointments Commission were of engineers: Professor Julia King, Vice Chancellor of Aston University; and Robert Mair, Head of Civil and Environmental Engineering at Cambridge. Also, on Monday, I had the privilege of representing the Company at the Lunch here at the Mansion House celebrating the Queen Elizabeth Prize for Engineering. This prestigious global award was won in its second year by Dr Robert Langer for his revolutionary advances at the engineering/medical interface employing polymers to control the delivery of large molecular weight drugs for the treatment of cancer and mental illness.

The theme for my Master's year, the military medical/engineering interface, has been reflected in a number of visits and presentations. In the presence of the Chief of the Air Staff, I am delighted to reiterate how much we enjoyed and learnt from our visit to the Royal Air Force's largest station – RAF Brize Norton. [See pp 15-16 Issue 35. ET] As well as comprehensive briefings on the four aircraft types, their different forms of engineering support and the vital roles they play in transport and air-to-air refueling operations in support of UK and Allied operations against ISIS, we were briefed on humanitarian operations including the aeromedical evacuation of the

injured from the terrorist atrocity in Tunisia. We were also shown the specialized equipment and techniques used in the transportation of Ebola victims, including Nurse Pauline Cafferkey who we are now pleased to learn is on the long road to recovery from the meningitis induced by this frightening disease.

Our visit to the Centre for Blast Injury Studies at the Imperial College Department of Bioengineering also underlined the extraordinary bravery and dedication of our people, together with the enduring legacy of injury in modern conflict. The Centre gave us a fascinating insight into the close collaboration between engineers and clinicians in improving clinical treatment and rehabilitation, and in influencing military equipment design. The scene was set for the day by a presentation from the Royal Air Force's Medical Emergency Response Team whose aircrew, surgeons and nurses extract seriously injured personnel in their specially equipped Chinooks – very frequently under intense enemy fire.

Speaking of brave helicopter pilots, we are honoured to have one with us tonight – he entered this room full of engineers this evening – and barely flinched. Air Chief Marshal Sir Andrew Pulford, Knight Commander of the Most Honourable Order of the Bath and Commander of the British Empire, has flown over 5,000 hours in Wessex and Chinook with the Support Helicopter Force, based in UK and Germany but also enjoying exchange tours with the Royal Navy's Commando Helicopter Force and the Royal Australian Air Force. Commanding in every rank, he has seen operational service in Northern Ireland, the Falklands, Lebanon, the Balkans and the Gulf. As Station Commander of Royal Air Force Odiham for two years from December 2001, Sir Andrew commanded the UK Chinook Force through a period of unprecedented operational activity, including large scale deployments to Afghanistan and Iraq.

His command and staff appointments have included AOC No 2 Group, directing the Royal Air Force's Air Transport, Air to Air Refuelling and ISTAR forces, Assistant Chief of the Defence Staff (Operations) and Air Member for Personnel & Capability. He was appointed Chief of the Air

Staff in the rank of Air Chief Marshal in July 2013 as the first ever exclusively rotary-wing pilot to hold the appointment. Talent will out, and I have no doubt that his fixed-wing colleagues saw this coming, but he has continued with bold and novel appointments. Earlier this year, again for the first time ever, he appointed an engineer as Assistant Chief of the Air Staff. This is not only enlightened but magnanimous when you realise that we met as "pen pals" with an exchange of notes under the respective windscreen wipers of our cars when a careless engineer air commodore reversed into an MGB which proved to be the pride and joy of the up-and-coming Wing Commander Pulford.

Incidentally, I was delighted at yesterday's Arkwright Scholarship awards to learn that the Royal Air Force is sponsoring 10 and cooperating with WISE, the Women in Science and Engineering campaign.



Sir Andy, we are delighted that you and Lady Pulford have joined us this evening, and greatly look forward to what you have to say. But first a brief welcome to our personal guest, my son David with his wife Donna and daughter Jemima and my son William. I trust CAS that you are impressed with David in his newly ranked wing commander's uniform. Worn for the first time at last month's Welsh Livery Dinner, it went down

THE LORD MAYOR'S SHOW Saturday, 9th November 2015

well - especially on the late train out of Cardiff when the hen parties returning to the Valleys mistook David for the stripper. William is sitting next to his Godmother, Jennifer Liddell and opposite Peter and Jennifer's son Matthew. They have all forgiven William his attempt to teach Matthew tree climbing when visiting RAF St Athan. William stayed in the tree while Matthew fell to earth and spent the afternoon with a broken arm in the Medical Centre.

Finally, a word to explain the absence of our Middle Warden: Richard, travelling on his own has been involved in an accident with a lorry in which his Volvo was written off. On arrival, the rescue services thought they would be cutting a body from the wreckage but I am pleased to report that Middle Wardens are made of sterner stuff and although he has some broken bones, he is expected to make an early and full recovery. We wish him and Janet well.

I must return to you My Lord Mayor and ask that you kindly accept these cheques from The Worshipful Company of Engineers as our Trusts' contribution to The Lord Mayor's Appeal and to the Mansion House Scholarship Scheme.



The Lord Mayor, after receiving the donations, returned the compliment by presenting the Master with a book of fish recipes – very fitting as the Lord Mayor's mother company is the Worshipful Company of Fishmongers!

Lord Mayor's Show Day like many others in the past 800 years dawned wet and windy. The difference in 2015 was our 5.15 morning rise to take part in the Lord Mayor's Flotilla on the Thames. For the first 400 years or so, this was the original route of the Lord Mayor's show as he travelled through the City from Temple to present himself to the Sovereign at Westminster.



The flotilla has been superseded in more recent years by a procession through the streets of London which travels to the Royal Courts of Justice where the Lord Mayor now swears allegiance to the Crown.

The flotilla now ends at Tower Bridge from where the Lord Mayor makes his way to Guildhall and into his coach at the start of the procession.

Much has changed in 800 years but the principal purpose remains: that the Lord Mayor is shown to the citizens of the City of London. Even the Black Death, the aftermath of the Great Fire and the Second World War didn't stop it! The only time this has happened was in 1852 when the mourners at the funeral of the Duke of Wellington so overwhelmed the City that the procession had to be cancelled.

The requirement for Lord Mayors to show themselves to the people was one of the conditions in Magna Carta in 1215 in which King John granted many rights to the City of London including the establishment of the mayoralty.

This year we remembered the tragic events the previous night in Paris with a two-minute silence at the start of the procession.



The Master travelled on the Ward of Cheap's float, the connection being that the new Lord Mayor is Alderman of the Ward of Cheap, and as Wax Chandlers' Hall is in the Ward of Cheap the Lord Mayor is our Alderman!



Incidentally the Wax Chandlers' Hall is also a magnificent position on Lord Mayor's Show Day especially when it's raining. This year several of our members joined the Wax Chandlers for lunch, but as we'd had such an early start with bacon butties and coffee on the launch, we opted to wait for the After the Fireworks Supper at the Wharf Restaurant.



We have been attending the Lord Mayor's Show for many years. On our first visit we strolled back to Waterloo Station along the Southbank, looking for a suitable place for Supper. We found the Riviera (now the

Wharf).... and the Fireworks. The following year we returned with a few friends but then word spread and in time a new event was added to the WCE calendar. Barry Gasper took over the organisation in recent years and it continues to be a popular way to finish the day - even if, as this year, there are no fireworks; they had been cancelled as a mark of respect for all the people who had lost their lives in Paris on the previous night.



Gillian Scahill





VISIT TO BREMEN 28th-29th November 2015

The last weekend in November saw the opening of Bremen's famous Christmas Market, an event which tied-in perfectly with a tour of the world's largest megayacht, currently under construction in Bremen. The MOOT was organised by Liveryman Paul Doherty who is Chief Engineer and Head of Construction and attended by Barry and Linda Brooks, John and Elizabeth Chandler and Dave Cooper.



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After an opportunity to take in the sights of Bremen's famous Christmas market (including



the famous Town Musicians of Bremen – see the Brothers Grimm story at <<http://www.bremen-tourism.de/bremen-town-musicians-1>>), the group

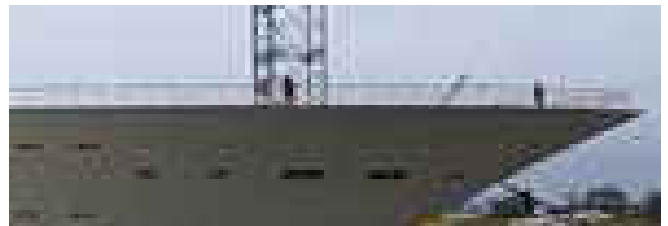


gathered on Saturday evening for a traditional Gluhwein toast in the town square. The square is home to the historic 15th Century Town Hall and Roland Statue (both granted UNESCO World Heritage status in 2004. For further information see <<http://goo.gl/OTCSHR>>).

The evening's dining experience was held among the ornate wine barrels and columns which are home to Germany's oldest cask wines, within the unique surrounds of the Bremen Ratskeller, a restaurant situated in the cellars of the historic Town Hall.



(ET: To get an idea of how big the yacht is – the photo below shows the three people standing on the bow.)



There are estimated to be only 5 megayachts (over 500 feet long) in the world and the private tour of the world's largest megayacht on Sunday morning was a unique insight into the design and construction of such a bespoke vessel. The nine-deck, steel and aluminium constructed vessel exceeded 500 feet long, boasted the largest volume and gross tonnage ever constructed; and represented one of the most technologically advanced and safest passenger vessels afloat. The yacht was larger and more powerful than many of the established cruise ships (and longer than the Royal Navy's Type 45 destroyers!).

We were exceptionally privileged to enjoy a top-to-bottom, bow-to-stern, 3-hour tour of the vessel as it is being outfitted. The scale of this project, its engineering, its luxury, the facilities, and the excellence and standards being supervised by Paul for the owner are fantastic.

We were extremely grateful to Paul for sharing his "day job", and describing some of the unique challenges that he is tackling, but we are sworn to secrecy about the details of what we saw. If anyone else should want to see a ship like this, you need to become mega-rich first! Although the ship will be long gone by the time of 2016's Bremen Christmas Market, that is still well worth a visit.

Paul Doherty and Barry Brooks

THE MacROBERT LECTURE In Conversation with Artemis Engineering Tuesday, 1st December 2015

This year saw our 'Bridge Lecture' replaced with a lecture jointly organised and funded by the Engineers' Trust, The Royal Academy of Engineering and the MacRobert Trust.



*Prof Wim Rampen FREng
Chairman Artemis*

The purpose of the new-style lecture was to expose some of the engineering behind the most prestigious prize offered by the Engineers' Trust and the RAE. It was attended by around 40 members of the Company and an

equal number of RAE guests

Artemis Engineering won the 2015 MacRobert prize, which has members of the Company on its judging panel, for the development of digital displacement technology in hydraulic pumps and motors. This will mean more to mechanical engineers than others, but in essence the technology overcomes a fundamental limitation of traditional, mechanical-based pumps where they become inefficient when used for oil flows below their maximum capability. A typical mechanical pump will reduce the piston stroke when there is low demand. Digital displacement technology monitors the flow required with a computer and switches pistons on or off accordingly. By doing this, frictional losses are significantly reduced, and transmission efficiencies become higher than competing electrical technology, making them viable in many situations. The use of computers in engineering systems is becoming routine and expands the capabilities of traditional engineering disciplines. This was a perfect example of such a cross-disciplinary approach in action.

The principal application explained was in large wind turbines, but demonstrators in cars and golf buggies were also described. The in-conversation

format, capably chaired by Dame Sue Ions, gave us an insight into the people and technology behind the company – how it grew over 40 years from a spin-out from Edinburgh University to and beyond its acquisition by Mitsubishi Heavy Industries. It was good to see that the company's efforts have been largely undisturbed by their new parent, and that the enthusiasm and drive to take things forward remains undiminished.

The evening concluded with a drinks and canapés session which was enjoyed by all. Feedback from the event suggests that this new format was preferred and should continue on an annual basis.

David Johnson

ANNUAL CAROL SERVICE AND DINNER St Peter ad Vincula and Clothworkers' Hall Wednesday, 9th December 2015

Steeped in history – the Chapel Royal of St. Peter ad Vincula or as it is more commonly known the Tower Chapel, has a history dating back almost 500 years and has many tales to tell of marriages, christenings through to the reading of last rites before executions and the burial of decapitated former Queens.



Our occasion, the Worshipful Company of Engineers Carol Service, has to be one of the Chapel's more pleasurable events. The service led by the Revd. Canon Roger Hall MBE and the Engineers' Chaplain the Revd. Peter Hartley was

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supported with the fabulous choral vocals of the Chapel Royal Choir.

The service featured a selection of popular traditional carols opening with Once in Royal David's City and concluding with Hark the Herald Angels Sing. The carols were interposed with several readings delivered by various Liverymen ranging from the Clerk through to the Master, plus there was a reading by the Master's Lady. All in all this was a fabulous service in a unique setting to awaken the Christmas Spirit.

Drama then followed when a member of the congregation succumbed to the incompatibility of modern ladies footwear and cobbles. However, unlike other poor souls whose heads hit the cobbles in front of the Tower, after a brief spell at A&E in the true spirit of the Engineer's she rejoined the party in time for dinner, well done!

The Carol Service Dinner was a sumptuous affair, held at the Clothworkers' Hall. The Hall, actually the sixth building on the site, in spite of having its origins back to 1472 is fairly modern re-opening in 1958 after its near total destruction during WW2. The "modern" neo-Georgian styled Hall is a shining example of British craftsmanship and the talents of our fellow Liverymen.

The Dinner commenced with a fabulously prepared dish of Guinea Fowl, followed by Thyme Poached Hake and as a finale Fig and Frangipane Tart, all washed down with some rather fine wines.

May I conclude my report by expressing on behalf of the Livery a vote of thanks to the Resident Governor of the Tower for granting us permission to hold the service in the Chapel and to express our gratitude to the Clerk and his assistants for their behind the scenes work in making the carol service and dinner such a memorable event.

Brian M Back



SITE VISITS TO CROSSRAIL 16th and 30th January 2016 (Two views of a tunnel!)

*40 stations including 10 of which are new;
Platform lengths of 245m;*

*66 new trains able to carry 1500
passengers at a cost of £1bn;*

*7 m tonnes of waste removed via
Paddington has been used to build new
wetlands at Wallasey.*



Significantly, the visitors were told that the project was on time and within the ‘funding envelope’.

The running tunnels were driven with two 7.1 diameter and 140 m long tunnel boring machines, one named Ada Lovelace the first female computer scientist and the other Phyllis Pearson creator of the London A-Z map. Each machine is now buried where they stopped!

The running tunnels are lined with precast concrete rings made up of segments. Other tunnels at Bond Street Station and Tottenham Court Road for the platforms, concourse and escalators are lined with sprayed concrete. At Fisher Street there is a length of running tunnel that is also being lined with sprayed concrete where extensive settlement monitoring at ground level and mitigation measure are included using techniques

In January 2016 a visit to the Crossrail project organised by Terry Morgan, a liveryman and Chairman of Crossrail, proved to be very popular and was oversubscribed and so an additional visit was arranged. Simon Howison and Barry Brooks wrote the reports for their respective visits.



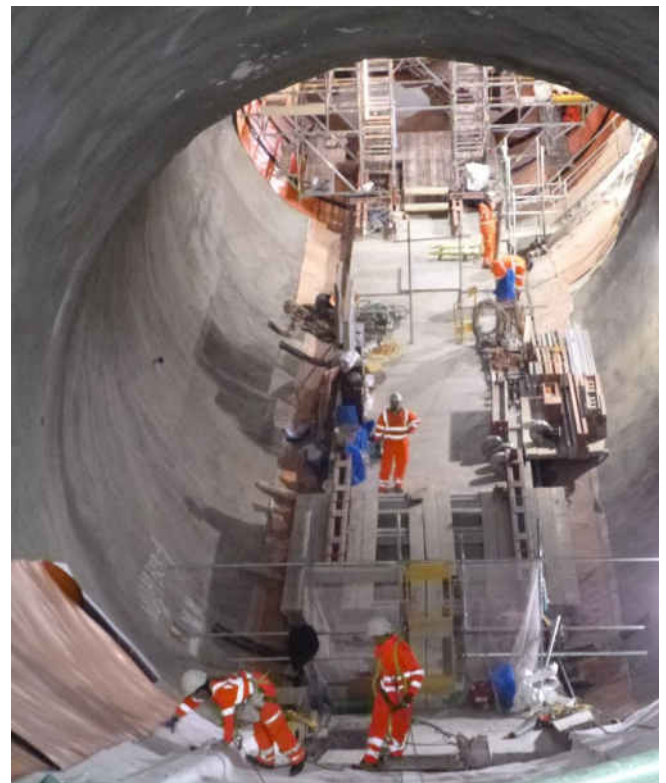
Each of them had a different view of the project, with Barry at the works at Bond Street Station while Simon had another view of the project from Farringdon Station.

The project statistics are impressive:

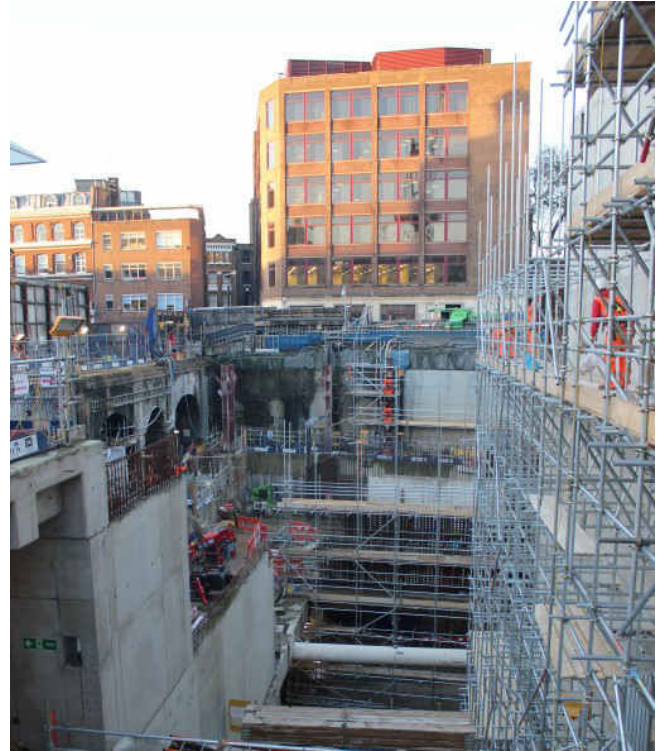
Project cost £15 bn;

*21 km of dual running tunnels 6.2m in
diameter;*

125km of new track;



such as compensation grouting. The design of the stations includes some novel features including platform edge screens to provide passenger safety and to separate tunnel air movement from that in the stations. The space above the stations is also being exploited for office development and other uses. At Bond Street the above ground development was being built around the enormous ventilation shaft. There is a brilliant time-lapse film sequence on You Tube at <https://youtu.be/3dLqrNUeoQg> plus there are other film clips of the construction operations on You Tube that impart a sense of the immensity of the works being undertaken.



The new trains will be standard surface trains with overhead electricity feed and in place of the traditional ‘time-based maintenance’ will be managed by ‘condition-based maintenance’. Each train will be 200m long and have a passenger capacity of 1500 as compared to the tube trains capacity of 800.

Crossrail has a safety initiative referred to as ‘Target Zero’ to deliver a world class health and safety standard across the programme. Target Zero is based on three principles:

1. Everyone has the right to go home unharmed after a day’s work
2. The belief that harm is preventable, and
3. Everyone must work together to achieve the target.

30% of the workforce are women; 15% are apprentices; 35% of the apprentices are from ethnic backgrounds; 40% are from NEET backgrounds. Training of young engineers was a priority and all sub contractors with a contract value more than £3m had to engage apprentices which has resulted in over 500 apprenticeships being created. The success of the Skills Academy in East London is being copied for HS2 colleges.



Both Barry and Simon were very impressed at the sheer scale of the project, the quality of the finish and professionalism of the Crossrail team and its contractors.





name and by medieval times there were nine Charterhouses in England. In 1534 the promulgation of the Act of Supremacy required an oath of loyalty from subjects recognizing King Henry's marriage to Anne Boleyn. The 18 monks at Charterhouse resisted the Act and were brutally murdered between 1535 and 1540.

The priory ceded in 1538, after which it was converted into a Tudor mansion, owned at one time by the Duke of Norfolk. When Sutton acquired the site the school and almshouse remained there until the school moved to Godalming. There was considerable damage in the Blitz but sensitive restoration enabled much of the medieval, 16th and 17th century fabric to be revealed. Today Charterhouse houses approximately 40 retired men, known as Brothers, living independent lives.



CHARTERHOUSE MUSICAL TOUR AND DINNER

Wednesday, 17th February 2016



In 1611, Thomas Sutton acquired the site of a former religious house from the Earl of Suffolk in order to found a school and almshouse for 40 boys and 80 elderly gentlemen. This was Charterhouse in Clerkenwell. Some four hundred years later I (and 49 other Liverymen and partners) came for a tour with historical music by the Thomas Sutton Singers.



The Carthusian order was founded in 1084 at La Grande Chartreuse in Grenoble; Charterhouse is the anglicising of the

We assembled in the Great Hall with its fine screen and magnificent Caen stone chimneypiece bearing the arms of Thomas Sutton. After a brief history of the site and its buildings, the group moved, via the Old Library, into the chilly Norfolk cloister where masonry dated from 1371. A hatchet (or ‘guichet’) through which food was served to a monk’s cell is a reminder of the austere environment in which they lived.

The ceiling of the cloister was installed 200 years later, to provide the Duke of Norfolk with a more impressive route to his tennis court. Later when the schoolboys started to kick a football within the confines of this cloister, it is believed that the term ‘throw-in’ was first coined by when the ball was recovered after inadvertently being kicked through the arches of the cloister. It was in the Norfolk Cloister that our group was treated to the first music, “Allelulia: Sancte Michael Archangele”, plainsong from the Mass of St Michael the Archangel.

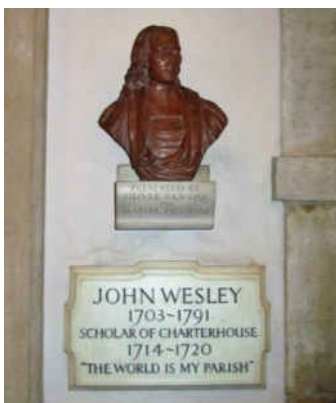
by 200 years, Elements of the Chapel date from the early 15th century (the altar was dedicated in 1414) with much realignment and reconstruction over the next 400 years. Unlike other buildings on the site, the Chapel survived the war almost unscathed and it and the organ remain in use today.

Moving upstairs, we came to the 16th century Great Chamber where both Elizabeth I and James I held court. Although the magnificent room and its ornate ceiling were victims of the Blitz, enough of the ceiling remained to enable a reproduction to be installed in the main chamber. The Duke of Norfolk added an impressive fireplace and overmantel during his tenure, depicting the Annunciation and the Last Supper, but this also suffered considerable damage in 1941.

Fortunately this has recently been restored. Most of us are aware that “Greensleeves” is often attributed to Henry VIII but in the Great Chamber, we heard the Thomas Sutton Singers complete our tour by singing another work thought to be by the King, “Pastime with good company”.

Sutton’s Hospital is, without doubt, one of London’s many historical gems. To visit it at any time would be an enjoyable experience; to make that visit accompanied by the voices of the Thomas Sutton Singers and amongst Company friends made it a privilege and I thank the Master and his Lady for the organisation of such a splendid and memorable evening.

John Bridgeman



Moving on to the Chapel Cloister and then on to the ante-Chapel, the group was told of John Wesley’s time at Charterhouse in the early 18th century, and of John Jones who held the roles of Organist of the Temple, Charterhouse

and St Paul’s Cathedral concurrently. Once more, the Singers added to the ambience, this time with a rendering of Psalm 23.



In the Chapel, we listened to an organ recital of Jeremiah Clarke’s Prince of Denmark March, and a further chant from the Thomas Sutton Singers. The Walker organ of 1841 was above an impressive screen that predates the organ



ELECTION COURT, SERVICE AND DINNER

St Vedast alias Foster and
Wax Chandlers' Hall
Tuesday, 8th March 2016

The 8th March 2016 was International Women's Day, the Election Court and the clothing of the last of Past Master David Scahill's "new boys" (*ET the Liverymen who were introduced to the Company during my Middle Warden's year when I was responsible for Membership*) some five years after EurIng Carol Long was admitted a Freeman. Being the first clothed as a Liveryman using the revised declaration, Carol says "It was a pleasure and an honour to be first to say those words. I hope my rendition is followed by many lady inductees who will no longer have to affirm that they would be a "good brother" in this Company. While there is only a minor change of wording it means no woman in future years can misinterpret the words to feel that they aren't welcome. On the contrary, the Company demonstrated that the welcome for women is universally friendly in this Company."



The honour of being Junior Liveryman lasted less than five minutes as our current Junior Liveryman Dr Tony Gillespie was clothed soon after as his wife, Pat, watched on.

The traditional ambush took place when the two new

Liverymen were quietly told that they had to give a brief after-dinner speech about themselves. It was explained that brief meant less than two minutes and a fate worse than death awaited us if we went on for ten minutes.

After the Clothing we walked past the Goldsmiths' Hall and around the corner for the

annual Election Service at the church dedicated to St Vedast (sixth century Bishop of Arras), a saint known by different names across Europe including Vedastus, Waast, Gaston and Foster. For their one occasion of the year, Beadle, Master and Wardens processed into the church.

The service followed a traditional English pattern of alternating hymns and words. The readings came from the First Letter to Corinthians and the Gospel of Luke, with themes of the builder being responsible for his work, stone being a stable foundation and durable building material, and that actions should be built on true foundations. Our Chaplain, Rev Peter Hartley, spoke about engineers building both physical and social bridges. The service concluded with prayers including the Lord's Prayer, the singing of Jerusalem, a blessing and the National Anthem. The collection was for the Engineers Trust.

Unhurried but progressing at a steady pace, the service was soon over and the procession returning back to the Hall followed by liverymen, freeman and guests for dinner. Partners had found a local restaurant to continue their evening. They missed an enjoyable menu of monkfish, venison and sticky toffee pudding. The dinner concluded with the usual toasts, speeches and announcements of the election results.

To conclude the International Woman's Day theme, the Company gave a thoroughly positive reception to the election of Professor Isobel Pollock-Hulf as our next Master Engineer, taking up the duties in April.



Master's Address

In what was the Master's last after-dinner speech to the Company he thanked the Wardens for their unstinting support in helping him deliver what he had referred to as a "year of consolidation, development and delivery" when he was installed as Master. He observed that they in turn had been supported by strong and active committees.

He expressed special thanks to the 'Johns' (Past Masters) but it was confusing when each of them was responsible for IPM, the Trust and Honorary Treasurer. We learnt that most of the time John agreed with John but sometimes John intervened and disagreed and John then.... The Master said it was his policy to agree with John!

He also thanked the Clerk, and his ever-changing team of Steve, Katy, Eva, Sandra, Geoff, Debbie, Susan, John, and Peter and Stanley! But, Christine came top of the polls for receiving thanks, whose support for the Master had 'been tremendous'.

The Master congratulated all those who had been elected, endorsed or nominated at the earlier Court meeting, particularly, on International Women's Day, Professor Pollock-Hulf, the new Master elect. He wished Isobel, a wonderful and rewarding year. The Master said he knew that she intended to make the year one of which Robin would have been proud, and speaking for the whole Company he said that we all stand ready to help her in any way.

Two liverymen had been clothed earlier in the evening, Eur Ing Carol Long and Professor Anthony Gillespie, who were congratulated by the Master. At the invitation of the Master those present toasted, 'the new liverymen'.

Finally, the Master asked those present to join him in congratulating Philip Hawtin who celebrated his 80th birthday in January and had kindly donated to the Trust the equivalent of the evening's cost of the Stirrup Cup.

Partners' Visit to Guildhall

A Roman amphitheatre, sentimental Victorian paintings and a dash of modern satirical art were part of the mix in a tour of the Guildhall Art Gallery, generously organised by the Master's lady Christine O'Reilly. In a lovely setting and warm ambience, Anne Marie (our Guide) competently introduced us to the building and a selection of its eclectic mix of art built up since 1670.



The Roman amphitheatre, initially of wood in 70 AD, was discovered in the rebuilding of the gallery in 1988, and the remains of its walls, terracotta tiles and the intriguing wooden plumbing are imaginatively displayed to bring life to the artefacts. We toured the different galleries. The Heritage Gallery has changing exhibitions and currently focuses on Shakespeare. The Undercroft Gallery, a sympathetic construction, concentrated on art works that related to the City. One was a portrait of one of the judges of the Common Pleas, painted by Michael Wright, an aspiring royal painter who never achieved that ambition. The 22 judges were appointed following the Fire of London in 1666 and with four-fifths of the City destroyed, their job was to mediate between interested parties to speed the process of rebuilding London. The judges were knighted and knighting judges has continued into the present day. This gallery included evocative nineteenth century paintings of the London markets-Billingsgate, Smithfield and Spitalfields; scenes of the City; life in the city; and two similarly positioned drawings of London Bridge - one in 1616, and the other, with a touch of whimsy, in 2016. Moving to the Main Gallery we passed colourful, impressionistic paintings by Matthew

The Swordsman

Smith, (Matisse influenced), to view the significant collection of Victorian paintings - beautifully coloured, exquisite in detail, atmospheric, and exuding light. They presented subjects with sentimental, idealistic and romantic associations, often linked with stories or legends. Some of Millais's work was there - sumptuous in their expression (the young girl in her red dress is imprinted on my mind). Some huge paintings were on display with a prominent place given to the siege of Gibraltar in 1782 by John Singleton Copley. And we saw the Worshipful Company of Engineers stained glass window, commissioned in 2002 at the time of the Queen's Golden Jubilee. It was a great visit.



Marilyn Wedgwood

SECOND INFORMAL WALK KENNET AND AVON CANAL Saturday, 19th March 2016

Our gallant band of 21 walkers gathered in the mist of the Wharf, Devizes early on Saturday morning to embark on the 2nd Informal Livery Walk – and a day of adventure, dining and social activity. Devizes is a charming market town in the heart of Wiltshire and some of us had the pleasure of visiting it and enjoying its hospitality both before and after the walk. The itinerary for the day had been carefully planned and organised by the Master and his Lady, and, for a gentleman of the Royal Airforce, the itinerary was surprisingly nautical.



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The day started with a gentle hour long journey in the direction of Newbury in a canal boat. We enjoyed hot beverages, whilst hearing the history of the canal. The original route of the canal had changed during conception, partly due to a lack of water near Marlborough and partly due to lobbying by Devizes MPs. The Kennet and Avon Canal required an act of Parliament (TWAO) and this received Royal Assent in 1794. The canal trade was diverse, from coal from the Somerset coalfields to tin plate boxes, but within forty years under-cutting competition from the railways forced a rapid decline. In 1852 the ownership of the canal passed to the Great Western Railway (GWR) by Parliamentary approval.



Nevertheless, the canal continued to carry carboys of acid late into the 19th century as the owners of the canal (GWR) thought the cargo too hazardous to travel by rail! Eventually the competition of rail and road transport stopped the trade by canal, but the Obligations in the Act prevented the canal being closed and GWR was forced to honour its maintenance obligations. In 1955 a second attempt was made in Parliament to close the canal, but after considerable campaigning, restoration was started and the Kennet and Avon Canal Trust was formed. Her Majesty, The Queen, re-opened the canal in August 1990.





plans. The company showed considerable ease and ingenuity in bypassing obstacles and then in crossing the canal to continue the walk.



Upon reaching The Bridge Inn at Horton, we disembarked and began our walk back to Devizes along the towpath. The heron and sleeping cat were not disturbed by our passing. Back at the Wharf, we had a short time for bodily and intellectual refreshment, as well as the opportunity to explore more of the Canal's history in the Canal Trust Museum.



We progressed (fortunately downward) beside the Caen Hill Locks, which are an impressive flight of 29 locks with a rise (or in our case, fall) of some 237ft in 2 miles (72m in 3.2km). The flight of locks is a fitting tribute to John Rennie's engineering.

The walk along the tow path out of Devizes in the direction of Bath was relatively easy, although renovation works attempted to thwart the best laid



En-route, several of our public-spirited members keenly offered their assistance in closing lock gates as we passed a number of canal boats during the challenge of mounting the flight. For a good crew we understood this would take around three hours – ‘though should you be unlucky enough to be behind a novice crew, the entire day may be needed to traverse the flight. At each level, reservoir ‘ponds’ had been constructed to maintain the flow of water, and at the bottom of the flight of locks we passed a (small) solar farm which now provides electrical power to a pump capable of returning 32 million litres of water a day to the top of the flight (equivalent to one lockful every 11 minutes). A further gentle walk along the towpath, not to mention a scramble over yet another fence, brought us to the Barge Inn at Seend, where we re-grouped and were joined by our two non-walkers.

The first task on arrival was to compare our various fit-bits, GPS and stepper devices. Estimates varied, but following some active discussion (and allowing for stride length and individual height) there was indeed a satisfactory agreement that we exceeded the anticipated seven miles.



Thus heartened, we enthusiastically joined in a hearty traditional lunch, together with 'sharing platters' for starters and dessert in an enjoyable and social meal, before a communal return to Devizes in shared taxis.

Those of us who stayed over on Saturday night, were only able to consume a very light supper due to the size of the earlier portions, but that didn't stop us consuming a couple of bottles of wine with our ongoing conversation in front of a log fire at The Bear Hotel.

To summarise in the words of one of our fellow walkers, we had putt-putt-putted, we had clambered, ambled and scrambled, and we imbibed, but mostly we just chatted. A great mix of history, engineering, good company, aching legs and two blisters.

Compiled by Audrey Canning from the comments of 'her merry band of walkers'

ESSEX TREASURES

The Museum of Power and Stow Maries Great War Aerodrome

7th April, 2016

What have the last “Lilleshall” triple-expansion steam pumping engine and virtually the only surviving Great War aerodrome got in common? Both are amongst the “Hidden Treasures of Essex” and close by Maldon - famous for sea salt and Thames sailing barges. More to the point, but both were part of the Company’s “Out of Town” visit on 7th April 2016. And both were chosen by Air Vice Marshal Patrick O’Reilly to round off a very busy year for his time as Master of the Worshipful Company of Engineers (WCE).

As a reminder, WCE Liverymen and their partners visited the Kempton Steam Museum on 20th June 2015 and saw the two Worthington & Simpson engines which once pumped water to Cricklewood and London. The Museum of Power’s comparable steam pumping engine was made by the Lilleshall Company of Oakengates, Shropshire, and named “Marshall” after that company’s deputy chairman. It was one of three units each originally pumping four million gallons of water to Southend-on-Sea via a 28” diameter cast-iron pipeline and was commissioned on 13 January 1931. The other two engines, which started service in 1927 and 1928, were scrapped in 1964, along with the 150 foot high hexagonal chimney and coaling plant.



Arguably, “Marshall” was even more impressive than the Kempton engines since, being comparable in size but standing alone in an “ancient monument” engine house, its huge size is at once apparent. The 18 ton flywheel alone is 14 foot diameter. After “Marshall” and most of the rest of the steam pumping station, dominating the village of Langford (Maldon), was retired in 1963, the seven acre site stood empty. However, in 1996 local heritage engineering enthusiasts agreed with the “Essex & Suffolk Water Company” (now part of the Northumbrian Water Group - NWG), to bring a small collection of artefacts and a powerhouse of enthusiasm to Langford. With NWG support, that start has led to today’s accredited Museum of Power, increasingly recognised for its triple charity aims - heritage engineering, education (“science, technology, engineering and mathematics” - STEM) and community engagement.

About 20 of us, WCE Liverymen and partners, plus some friends from the Institution of Mechanical Engineers (IMechE), were entertained at the museum, starting with arrival refreshments, and looked after by museum staff, trustees and volunteers. Marshall, restored back to steam operation by the museum through to 2011 (and now given an IMechE Heritage award), was run for us. We toured the site with its amazing power collection which ranged from domestic vacuum cleaners and kitchen equipment via an interactive “boiling-kettle, turbine, generator, lamp” display to several impressive and gently noisome engines from the 19th and 20th century. A couple of school-built record mileage economy cars illustrated the museum’s vibrant engineering education outreach as did the “Story of Water” exhibits. Altogether, the museum houses an enviable collection of power and engineering exhibits. And in the grounds was “the largest model village in Essex” - just right for small children.



Perhaps the stars of the show were the “Victorian belt-driven workshop”, with everything running in seemingly perfect order, and the 7.1/4” miniature railway with its workshops, turntable, servicing depot and double-platform station. Some of us even penetrated the huge cellars below Marshall - and heard about visionary plans for their future use.



An excellent and filling lunch was taken in the on-site converted workshops, now a popular local tea-room. The only complaint was that there was not enough time to see everything nor to learn sufficient about the museum’s STEM education programmes or its arts and other community activities. For now it was time to journey the 8-9 miles to Stow Maries.

Our pictures show a few of the moments we enjoyed - including most of the group around the Air Ministry (Royal Flying Corps) memorial at Stow Maries aerodrome. (See Page 27.)

The trustees (the museum is a registered charity and is “accredited”) explained the background, history and aspirations of the museum. In particular, trustee Ray Anderton, with help from part-time staff members Debbie Thomas and James Gulleford, conducted the guided tours. The aspiration is that the museum will grow and become more diverse and that it will expand its education and cultural programmes. Although it is hoping to attract more volunteers, especially at “management level” (e.g. for marketing and fund raising), there is already every prospect that its success will lead to its being a major attraction in the area. It is adjacent to a number of significant places of interest, including a nearby abandoned 19th century steam mill, one of the best military museums in the country, more than a couple of heritage railways, the attractive ancient seaport of Maldon, a 200-plus years old canal - the Chelmer and Blackwater Navigation -, the Royal Horticultural Society’s “Hyde Hall” gardens - and our next stop - the Stow Maries Great War aerodrome.

This really has been a “hidden treasure”. The 170 acre site came perilously close to being redeveloped but, through the efforts of Russell Savory, who rediscovered Stow Maries and initially bought it, and now via the charitable trust which has been set up, its future looks secure.

Recent Heritage Lottery Fund and other monies have allowed a strong programme of restoration to get under way and much has been achieved already. The new “visitors’ centre” showcased how life had been for the 200 - 300 airmen and women and the many civilians who were stationed there from its inception.

The first aircraft arrived in 1916. Incredibly, the first commanding officer for Stow Maries, Lieutenant Claude Ridley of the Royal Flying Corps, was only 19 years old - but with Western Front service and both the Military Cross and a Distinguished Service Order.

The station was in full operation from 1917 and its buildings and infrastructure were complete by the last part of 1918 but it was to cease operations by early the next year and thence forward was left alone and silent, its buildings abandoned to the elements.



Now there are more than a score of the original buildings undergoing sensitive restoration. A growing collection of historical pieces have returned to the site and a small number of real aircraft and other items from those times are permanently there, joined from time to time by visiting aeroplanes. One can almost still smell the dope and operational materials which once were everyday life here. There was a real buzz from the activity of the volunteers and professional people bringing back a place that went to sleep virtually a century ago.

Russell showed us some inspirational videos and led the site tour. We were treated to an excellent afternoon tea and the chance to inspect many of the period artefacts which have been gathered. The group photograph was taken at the Air Ministry war memorial to commemorate those who lost their lives at Stow Maries, not least because of the hazards of flying aircraft whose development was in its infancy. It was a sobering moment.



It took some persuasion to get the party to leave the hangar, where we were able to inspect close-up and “hands on” the resident aircraft fleet and the interesting associated equipment (and some entrancing model aeroplanes for small children!). Pat O’Reilly can be seen recording Isobel Pollock’s obvious enthusiasm to take to the air.



Finally, we saw some of Russell’s outstanding wildlife photographs and video footage. We heard about Stow Maries’ engagement with the BBC and its valued ongoing contributions to the channel’s nature programmes. We learned, for example, that it’s the only site where all five species of British owls are thriving and that they all have been captured “on film” by Russell. Almost a quarter of the 170 acres of the whole site is now a superbly managed Essex Wildlife Trust nature preserve.

It was an intense and satisfying day. We left determined to come back and see more of the “hidden treasures” in this part of Essex - so close to London yet so overlooked. We said our “thank-you’s” to the staff and volunteers at the Museum of Power and Stow Maries and took our leave recognising that not everything east of London is “TOWIE”.

For visitor information, see www.museumofpower.org.uk and www.stowmaries.com

John Lowe



In 1998 he went to the Royal College of Defence Studies and was then appointed Director of Operational Requirements (Land). In 2000 he was appointed as Capability Manager for Manoeuvres and then in September 2003 he was deployed to Iraq as Senior British Military Representative and Deputy Commanding General, Multinational Force, Iraq. In 2004 he became Technical Director at the Defence Procurement Agency and Master-General of the Ordnance. Then in 2006 he became Deputy Chief of the Defence Staff (Equipment Capability). He retired in October 2009.

In March 2010 he became Chief Executive of the British Transport Police Authority.



Christopher Joseph Bennion
CEng FICE FCIHT MIED



Chris is a chartered civil engineer with over 40 years of experience in the field of temporary works in the construction industry. Among his roles for several leading contractors, Chris has headed Amec's Specialist Engineering Services facility and served as Engineering Manager for

both Morgan Sindall Professional Services and Kier Professional Services.

Primarily involved with highways, career highlights have included design related work on the A55 at Penmaenbach, M6 Thelwall viaduct refurbishment, M6 Toll, A1(M) Darrington – Dishforth and M74 Completion projects. Chris headed the team that designed the British Construction Industry award winning temporary road bridge at Workington following the 2009 floods. Latterly, he has been involved with the Mersey Gateway project on design of essential enabling works and undertaking independent design checking. Currently he is in semi-retirement in an advisory role for Kier Construction.

COMPANY NEWS

January Court Meeting

Welcome to three new Liverymen Clothed at the Court Meeting on 12th January 2016

Lt Gen Andrew Collingwood Figures
CB CBE FREng



Andrew was educated at Loughborough Grammar School, Welbeck College and St Catharine's College, Cambridge. He was commissioned into the Royal Electrical and Mechanical Engineers in 1970.

In 1995 he was appointed Commander of Equipment Support at HQ Land Command from where he was deployed to Bosnia for which he was awarded the CBE.

The training of others for career development and safety in the workplace are central to Chris' interests. He is a Supervising Civil Engineer and Reviewer for both the Institution of Civil Engineers and the Institution of Engineering Designers, presents lectures on construction techniques at Northern universities and on safety related matters at Health and Safety Executive events. He is an active member of several Temporary Works Forum committees.

Chris is a long standing member of the Institute of Advanced Motorists, competes at club level on his classic Ducati and, together with wife Carol, raises charity funds via the National Garden Scheme

**Mr John Edgar Chandler CBE
FRAeS CEng**



John joined the RAF from school and trained as an Engineering Officer at the RAF College. The next 20 years was focused on the Cold War, working with the Canberra, Phantom and Tornado aircraft in the UK and in Germany. The fall of the Berlin Wall in 1989 saw the Armed

Forces move into expeditionary warfare, and John spent much of the next 15 years supporting RAF operations in the Middle East and the Balkans, interspersed with a few quasi-diplomatic posts in the latter years. After leaving the RAF he spent much of the next 10 years to date in prison, hearing applications for the release of life sentence prisoners as a Member of the Parole Board of England and Wales. John and his wife Elizabeth now appear to have settled into a village life north of Cambridge, although 23 previous house moves has undoubtedly left them with itchy feet. Their first priority is their two daughters and four grandchildren, but they also enjoy travel. John is now looking round for charitable opportunities on the basis that one marries for love, not lunch. Both John and Elizabeth look forwards to playing their full part in the social life and the charitable work of the Engineers.

March Court Meeting

Welcome to two new Liverymen Clothed at the Court Meeting on 8th March 2016

**Eur Ing Carol Ann Long
BSc CEng FBCS FLPI**



Carol is a software and systems engineer with primary interests in business transformation and governance. Currently managing the professional services team in a division of Advanced, the third largest United Kingdom based software company,

her customers include charities and membership bodies, including a number of engineering institutions.

Carol's previous roles have included writing software in the finance sector, managing commercial software development projects with a team distributed across five continents, managing an education sector change programme involving more than 400 autonomous organisations, project quality manager for Philips Semiconductors consumer electronics products, and as a specialist programme and project management consultant working in the public sector.

Her engineering education has been broad and started while still at school through family connections in automotive and gas. Continuing studies lead to post graduate qualifications in both engineering and business. Carol holds Chartered status as an Engineer, IT Professional and Quality Professional.

An interest in engineering education and formation has lead to hands on involvement as a visiting lecturer and as chair of school governors. She has also served on boards, awards panels and committees for the Institute of Directors, British Computer Society, Chartered Quality Institute, Association for Project Management, London Excellence Awards and Women's Engineering Society.

The Swordsman

Writing interests have led to Carol contributing to the professional bodies of knowledge for British Computer Society, Chartered Quality Institute, Association for Project Management, Project Management Institute and IEEE. She was a founder member of the Governance of Project Management special interest group and has been active in their publications.

In her spare time, Carol is as likely to be found with a book, a steam locomotive, a pair of secateurs or the latest electronic kit.

Professor Tony Gillespie PhD FIET CEng FREng



Tony's career started with a thick-sandwich apprenticeship with AEI, which became part of Marconi Radar Systems during his time at Liverpool University.

The first phase of Tony's career was as a radio-astronomer, starting with a Cambridge PhD looking at the early universe at 1420MHz. Leaps in frequency to 230GHz and 460GHz followed with positions at Queen Mary College and tenure at the Max Planck Institute for Radio Astronomy in West Germany. Tony developed heterodyne radiometers to solve specific astronomical problems by taking them to various mountain tops around the world.

The opportunity to set up a microwave research department for British Aerospace signalled the start of his second career phase. Experiments and designs had a strong mathematical basis, leading to novel designs for seekers, smart munitions, radomes and factory test equipment. The end of the Cold War changed business priorities with consequent changes in engineering management responsibilities. These included communications, signals intelligence, Chief Project Engineer and satcomms to oil rigs.

The third career phase was as a government scientist/engineer with Dstl (Defence Science &

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Technology Laboratory). This was initially to lead a team developing microwave and laser radars for safe low-level flight. Alternative and ultimately superior map-based auto routing techniques were developed, starting Tony's interest in autonomous systems. Technical responsibility for new airborne radar systems continued as well as building Dstl's avionics capabilities, leading to a Dstl Fellowship and appointment as a Visiting Professor at UCL. Autonomous systems dominated the last part of this phase, with engineering interpretations of the Geneva Conventions for new UK weapon systems and reviews with MOD and international lawyers.

Following formal retirement, Tony's career continues with UCL and developing engineering solutions to ethical problems in the design of autonomous systems.

OBITUARIES

Hugh Nicholas Hargreaves MA MSc C Eng TD FI MechE FIET 1937 - 2015

Nick Hargreaves (Livery No 626) died on 23rd October 2015. Friend and colleague Middle Warden Richard Groome wrote of him:



Bon viveur and engineer, Liveryman Nick Hargreaves died recently after a brave battle with cancer. Known better to northern members, Nick was a giant of a man who lived life to the full, and even whilst poorly, still travelled south to Lords (as a member) to see a recent Test match. He was a member of three wine and good food societies, most interesting being as a Commander and Grand Argentier of the Commanderie de Bordeaux in Manchester.

After National Service with the Royal Artillery, Nick studied at Queen's College, Cambridge, before completing an apprenticeship with Baker Perkins and gaining an MSc in Production Engineering at Birmingham University. He worked his way up to be Managing Director for

Delta Electrical Accessories Ltd., Chief Executive of Berl and director of Hamworthy Engineering. He also completed another 12 years military service with the Territorial Army.

Nick was a specialist military historian and led battlefield tours for the period from 1815 onwards, and a tireless charity worker for Homes In Zimbabwe and the Army Benevolent Fund. Sadly missed by Georgina, his wife, three children, six grandchildren and many friends

**Dr Cecil Charles John French
DSc MSc BSc(Hons) FEng CEng
FIMechE**

Cecil French (Livery No 247) died on 10th April 2016. Keith Millard has written the following of his friend and associate:



Cecil French established himself as a respected diesel and petrol engines research and development engineer early in his career. Following awards of a First Class Honours degree and an MSc from Kings College London and

completion of his graduate apprenticeship with CAV, he won a scholarship to study at Columbia University. This was followed by research of combustion in petrol engines at the Massachusetts Institute of Technology.

On his return to the UK in 1952 he joined Ricardo Consulting Engineers based in Shoreham by Sea, where Cecil continued to live for the remainder of his life. He became good friends with Sir Harry Ricardo and met his first wife Joyce there. She sadly died in 1969. His career progressed and he became a director in 1969 and Managing Director 1979 – 1983. He then became Chairman of its educational, instrumentation and manufacturing subsidiary G Cussons. Leading up to retirement in 1992 he was made Group Technology Director. Through most of his career Cecil has played a very active role within the profession. He joined the Institution of Mechanical Engineers in 1949, becoming a Fellow in 1966 and its President in 1988. He then became Chairman of the

Institution’s Council Dining Club which he continued to do for 20 plus years until 2015. His light touch steering of the dinners which are at the heart of the Club endeared him to a wide section of the senior membership. He would rarely miss a dinner and was always supported by wife Shirley. That said he kept the President of the day firmly focused on the time so that he could catch his 22.47pm train back to Shoreham.

In 1982 Cecil was elected a Fellow of the Royal Academy of Engineering. Also in the eighties he became President of the Diesel Engineers and Users Association and in 1983 President of the International Council of Combustion Engineers (CIMAC). The following year he became a visiting professor at King’s College until 1990. The university in 1987 awarded him an Honorary Doctorate. Similarly, in 2006 he was awarded a second Honorary Doctorate by Brighton University.

Much of this contribution in the eighties was acknowledged in 1987 when he was made a Freeman of the City of London, becoming a Liveryman of the Worshipful Company of Engineers in 1988. He continued to be a supportive member until his death.



It is no surprise to know that he was an active member of the Shoreham community. A Rotarian for many years and the local Club’s President in 1996/7 and again in 2008/9. The local Maritime Marlipins Museum benefited from his wisdom as a Trustee and its Chairman. He was also Governor of Glebe School.

His list of attributes is long, understated in style, but ready to forcefully challenge an engineering point with a warm glint in his eye. Always encouraging, he liked to be organised and to see others being the same. His advice to an upcoming successful young man was ‘try not to worry about things you can’t change’.

The Swordsman

His first wife introduced him to folk dancing very early on and he continued to play an active role engaging most of the family in the activity until very recently. He is survived by Shirley, whom he married in 1971, four children and nine grandchildren.

WELCOME! Clerk's Secretary and Event Coordinator



The Company has recently appointed Sandra Watts as Clerk's Secretary and Event Coordinator.

Sandra has over the past 25 years worked within the Oil and Gas, Telecommunications, Estate Agency and Leisure sectors reaching senior PA level. More recently Sandra held the position of Company Events and Training Manager with The Company of Watermen and Lightermen based at Watermen's Hall and is familiar with the City and its Livery Company world.

In her spare time Sandra enjoys playing netball, walking and travel. She will be celebrating her

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30th wedding anniversary this year with Andrew and has a son and a daughter.

Sandra is delighted to be joining the Company at an exciting time and getting to grips with Web Office!

AND NOW IT'S "GOODBYE FROM ME AND HELLO TO HIM!"



It has been great fun editing The Swordsman for the past two years following on from the 10 year marathon by my predecessor Past Master Raymond Cousins. I am most grateful to all the contributors in words and pictures.

But all good things must come to an end and with the advent of the soon-to-be implemented WebOffice and enhanced Website it seems the right time to hand over to Court Assistant Raymond Joyce to take The Swordsman through the next phase.



You may have noticed that the Company record in this edition finishes with the Election Court Service and Dinner. This is because future editions will record the course of each Master's year, starting with Installation. Master Isobel Pollock-Hulf's year will be recorded in two editions but the plan is to move to one printed "Year Book" for each subsequent Master with articles on Livery events and Livery people published electronically throughout the year.

I leave you thanking Raymond for taking on the editorship and it only remains for me to say: "Goodbye from me and Hello to him!"