Karen Burt Award Winner

A constant battle against mother nature’s heavy rainfalls in her daily working life and a growing ‘to do’ list do little to dampen the spirits of the 2015 Karen Burt Award recipient Helen Randell. She says she “absolutely loves” her role as a civil engineer despite contending with tight timescales and harsh weather conditions.

Speaking to The Woman Engineer, Helen said she was “delighted” to receive the award but the reality of it still hasn’t sunk in.

“I was particularly pleased to attend the Prestige Lecture in London for the award presentation and meet with my peers and my reviewers for the award. The lectures were brilliant and were worked together seamlessly. Although I often think we need more women engineers in senior positions being at the lecture gave me an opportunity to appreciate that there are women in real positions of power, which is really inspiring.”

Helen is a born problem solver and champion of engineering for women and girls. A chartered civil engineer who graduated only five years ago, Helen started acting as an ambassador for the engineering profession while she was still a student at Cambridge. Since then she has worked on major projects with Interserve Construction including Severn Trent Water, Glasgow Energy from Waste Scheme, motorway and A-road new junctions and widening and the Hereford and Worcestershire Energy from Waste Scheme.

Her work on these projects, coupled with a significant contribution to the promotion of engineering to young people and women in particular, has earned her a place on the roll call of winners of the Karen Burt Award, given by WES to honour the best of the year’s newly qualified women engineers.

During her career, Helen has mentored many young people embarking on careers in engineering; presented at science fairs; given talks to schools and even developed her own school learning packs to introduce children to surveying, earthquakes, bridge building, water filtration and renewable energy. She continues to inspire young engineers through her new role at Buckingham Group Contracting Ltd while mentoring engineering apprentices. She can currently be found on site near Atherston were she is working to a tight timescale on the national distribution centre for Jaguar Land Rover.

“Shehave a female graduate on my site at the moment,” she said. “I love mentoring people and doing a lot with schools - opening up people’s eyes as to what they want to do. There are lots of opportunities and so much is going on. The difficulty is getting the message across, as there are so many different engineering sectors and roles within each one that the profession is almost too good for our own good – it’s hard to explain the role of an engineer when it’s so wide and varied. I think because of this we miss getting girls into the industry because we don’t articulate enough.”

Helen says for her the decision was a natural one. “I was rubbish at English but good at physics and maths. What was really good for me was that I did a year in industry so I could see what it was really like. People have to choose to specialise really early on when they don’t fully understand what they want to do. I would recommend a spell in industry early on. Apprenticeships are also absolutely brilliant as workplace learning is an excellent option.”

Helen’s role is full of what she calls “constant change”. She says she thought she would be worrying about the big decisions when often she finds herself juggling logistics decisions. Luckily for Helen she has become very skilled at problem solving. She still chuckles though when a delivery driver on site queries whether she is OK to sign for something (presumably because she is a woman). “Well I did order it,” she tells them, “so I should be able to sign for it!”

STOP PRESS....... WES wins award for NWED, see page 10
President’s Message

I would like to thank Past President Dawn Bonfield, she will be a hard act to follow as she has played such a significant role in the development and growth of WES into a charity that is approaching ever closer to its 100th year through the devotion of its volunteers.

So what has happened since I became President in October? I was asked to talk live on the BBC on Ada Lovelace Day. The media has embraced the day from its launch in 2009 and it has grown from strength to strength with engineering being talked about and tweeted worldwide. I took the opportunity to share the concern that women make up only 9 per cent of the engineering workforce, and how we are losing girls when they drop physics at A-level. Also we talked about women engineers taking to twitter to dispel the myth that all engineers are men – the posting under the #looklikeanengineer and the selfies were posted online and attracted comments about the credibility of these women, thereby changing the assumed sexist appearance of engineers. Is there cyber sexism, where images used to portray us as engineers are not relevant or are too male biased? Does this have an effect on girls being put off applying for physics A-level or engineering?

Newly appointed Naomi Climer, IET President, also made news with the suggestion of women engineering quotas to ensure a more diverse workforce. I am sure it is of no surprise that over the coming decade the profession will require 1.8m people who have an engineering skill, so we cannot afford to lose our young talent by not portraying the profession in a way since the eighties when the big screen thought of women in terms of supporting roles, however it seems that actresses are still paid considerably less than their male counterparts so not much has changed in that respect. The gender pay gap is something we also touch upon in this issue as the government looks to force companies to consider the often-taboo matter.

According to statistics from the Institute of Physics the numbers of girls taking A-level physics also hasn’t improved in thirty years, so perhaps in many ways we are still living in the eighties. Our clothes are better, our communication systems have transformed beyond our wildest dreams and our tolerance to improper behaviour has heightened so please don’t tell me we are going back to the future...

Next issue contribution 20th January 2016

Talent 2030 National Engineering Competition for Girls

28th September to 18th December. Free to enter competition for 11-18 year old girls to submit their ideas for ‘How can engineers solve the challenges of the 21st century?’. www.talent2030.org/competition

IET’s Young Woman Engineer Awards 2015 including the WES Prize

3rd December, Savoy Place, London. www.conferences.theiet.org/ywe/

Lecture – ‘The raising of the Costa Concordia’

12th January 2016, Strathclyde University, John Anderson Building Lecture Theatre, 5.45 for 6.30pm. A free lecture by Titan Salvage - joint WES meeting with IMarES, ICE, RINA, IMechE and IStructE

Women of Silicon Roundabout

28th January 2016. WES members can get a 20 per cent discount by using the code WES20. see: www.women-in-technology.com/

National Women in Engineering Day

23rd June 2016 - nationwide

Check the WES website for more events

STOP PRESS...... Join WES in January and get 15 months for the price of 12.
The first of a series of planned catalyst events, which will run between now and the first international festival in summer 2017, took place on 13th October in Penrith. Fifty educators heard from leading speakers, including Mike Berners-Lee, author of *The Burning Question*, and were invited to help shape this exciting initiative. More events are intended and WES members are invited to take part.

The purpose of EnergyUnearthed is not to drive the energy debate, but to increase public understanding of energy and climate change science. Energy touches every aspect of our lives and the festival will use this as a springboard to explore the latest technology, engineering and environmental topics, as well as food and farming, health and wellbeing, arts and architecture. An advisory panel of leading industry and energy experts will guarantee the quality of science being presented, ensure neutrality and support the delivery of the latest good science fact.

EnergyUnearthed's managing director, Andrew Lucas, outlined the vision at the October event. At its heart is a family-friendly interactive festival of workshops, exhibitions, games, performances, and street entertainment. Other core elements will extend the reach of the work through the year and include a legacy of online resources.

EnergyUnearthed is supported by Fellows of the Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA) and has a growing body of local and national partners including the Women’s Engineering Society.

A key focus is EnergyUnearthed's STEAM-powered education programme - adding the arts to STEM to drive creativity and to communicate new concepts and ideas. Dr Sarah Peers, WES Vice President and EnergyUnearthed's director for education and industry, adds: “The education programme aims to inspire schoolchildren, parents and teachers, but we will also wish to challenge perceptions of engineering and STEM, which includes addressing diversity amongst other issues and highlighting creativity as a key skill. We want EnergyUnearthed to be transformational - not only by addressing the skills gap in energy and adjacent sectors, but by enabling educators and the young to understand the science of climate change. We will be linking to the Sparxx WES project and are keen to hear from WES members who would like to support or get involved, particularly to promote engineering for energy and as a route to solving climate change.”

For more information, contact Dr Sarah Peers and Andrew Lucas through info@energyunearthed.com or EnergyUnearthed’s facebook page or through twitter @energyunearthed.
After 30 years of time, effort and money, it is clear that we have failed completely to increase the proportion of girls choosing physics and engineering studies and careers, leaving the UK at the bottom of the European league tables for women employed in science and engineering.

A revolutionary approach by Network Rail, which saw the organisation achieve an 83 per cent increase in applicants to its graduate engineering programme in only five months, could be the answer says Prof Averil Macdonald OBE.

Her claims are based on the report ‘Not For People Like Me’ which she helped prepare for WISE (Women in Science and Engineering). The report is sponsored by Network Rail, and investigates why STEM outreach and engagement activities have a limited impact on girls and other young people who are under-represented in the STEM workforce. The report recommends a fresh approach - focusing on the types of people who succeed in science, technology and engineering - using adjectives to describe their personalities and aptitudes, rather than the jobs themselves.

Speaking from the heart and from the head at a Worshipful Company of Fuellers conversation evening earlier this year, Prof Macdonald said that one barrier is that many teachers and mothers simply didn’t appreciate the opportunities physics offers later on in life. “Girls don’t like to limit their options,” she said. “Remember that girls tend to think logically and they are often told that physics is not something that can be used beyond being a teacher or scientist.”

Prof Macdonald argued that the trend towards organising physics and science competitions to encourage more girls to study physics was also part of the problem. “Competitions simply don’t work,” she said. “For those girls who don’t win, it reinforces the message that you aren’t good enough. It is a repeated message.”

Renewed research suggests that although many girls are good at physics they still believe “It’s not for people like me”.

**PHRASEOLOGY**

According to research by www.bbc.co.uk/news/education, on average, girls achieve well in the subject at GCSE but female participation begins to fall at A-level. Just 21 per cent of A-level physics students are girls. The situation is different for biology and chemistry, where 58 per cent of biology A-level students and 48 per cent of chemistry A-level students are female.

Also the same research found a quarter (25.2 per cent) of female candidates achieved an A in AS-level physics, compared with just over a fifth (21.4 per cent) of male candidates and at A2 35.5 per cent of female candidates achieving an A or A*, compared with 29.9 per cent of males.

Ironically, the very reason that girls have an aptitude for physics – logic – is often the reason so many choose not to pursue the subject on an on-going basis. “Girls are making a logical choice but based on poor information”, said Professor
Macdonald. “We are using incorrect words and sending the wrong message. If we use verbs to promote a profession, half of the population – those who consider themselves in terms of adjectives are instantly disinterested from applying as they don’t consider the position to be of relevance. It’s not for people like me.”

Averil said that by adding the “person” specification to the job description when talking to young people, the balance can be readressed. As part of the work, Prof Macdonald has developed a careers resource. Using a set of adjectives she has mapped adjectives to the roles that exist in STEM businesses and trialled it with 300 girls. She said it had proven effective in encouraging girls to see they have a role and a place.

The messages focusing on what pure scientists and engineers ‘do’ rather than their personal attributes are not working so the report suggests that careers from STEM need to be described instead in terms of the personal characteristics required. Young people and their influencers – parents and teachers - need to be convinced that STEM careers offer what they are looking for.

The report suggests that there should be no implication that girls must change; the needs of girls and young women, including supportive employment conditions and the ability to progress while working part time, must be consistently embedded into all messaging from the STEM sector; and all girls need to be able to self-identify that ‘science is for people like me’.

The research also suggests that there is a larger problem in state schools than in independent schools.

The realisation that girls are good at physics but they simply believe that it “is not for people like me” has at least helped us to focus on whether it is the manner of promotion and terminology that is the problem. Time will tell if adopting a new approach to promoting further study in the subject including the manner of promotion and terminology that is the problem. Time will tell if it “is not for people like me” has at least helped us to focus on whether it is.

## Institute of Physics statistics facts:
- 10 per cent of all those who are eligible to take A-level physics choose to do so.
- Physics is the fourth most popular subject for boys - 24,000 or 15 per cent of eligible males choose physics.
- Physics is the 19th most popular subject for girls - around 7,000 out of more than 150,000 eligible girls take physics.
- 49 per cent of state schools in England and Wales send no girls to study A-level physics while girls from single sex schools are 2.5 times as likely to study A-level physics. School culture is the predominant factor in this.
- Girls make up 20 per cent of those taking A-level and 21 per cent of those taking degrees in physics - a percentage that hasn’t improved over 30 years of interventions.
- Maths is the most popular degree subject for girls who have taken A-level physics.

### Cyber sexism putting girls off engineering careers

Online images still portray engineering as a job for the boys, leading to girls being put off potentially well-paid and exciting careers, according to new research from EngineeringUK.

The study, released to mark the start of Tomorrow’s Engineers Week (2nd to 6th November), found a host of organisations, including universities, media outlets, and search engines are all guilty of reinforcing engineering stereotypes through their choice of images online.

Almost a third (29 per cent) of all those 11 to 16 year olds surveyed believe images used to represent engineering are not relevant to them, with 28 per cent of girls saying they are too male orientated.

Almost one in ten (7 per cent) of the girls went so far as to say that images they’d seen online have put them off a career in engineering.

### GCSE Physics for Life App now features WES role models

The app for GCSE Physics For Life, supported by WES Company Member National Grid, now features WES role models. There is an Apple and an Android version.

### Accenture report on lack of women in STEM careers

A survey of 4,000 girls, young women, parents and teachers, published by Accenture, reveals that there is a perception that STEM subjects and careers are better suited to boys. Half (51 per cent) of the teachers and 43 per cent of the parents surveyed believe this perception helps explain the low uptake of STEM subjects by girls.

Responding to the survey, Naomi Climer, IET President-elect, said: “The difficulty in attracting women into engineering is down to a combination of many things, including the image of engineers within the UK, careers advice girls are given in schools and the way that companies with engineering roles advertise their opportunities.

“If we continue to fail to attract women into engineering, the UK will be in a significantly weakened position to find the 1.82 million engineers it is estimated the country will need by 2022.

“Women are missing out on interesting and rewarding career opportunities and industry is missing out on the innovation that comes with greater diversity in the workforce.”

Research published by the IET in March 2015 as part of its Engineer a Better World campaign, revealed that only 7 per cent of parents feel that engineering would appeal to their daughters as a career.
An inquiry to inform government strategy on reducing the gender pay gap, focusing on women aged over 40, is being undertaken by the Women and Equalities Committee. Despite extensive evidence that this is where the gender pay gap is greatest, the government’s recent announcements devote surprisingly little attention to the issues faced by this particular group.

The government will be announcing its proposals to tackle the gender pay gap in early 2016. Currently the gap between all male and female employees stands at 19.1 per cent (2014), measured by median gross hourly pay. For all full time employees the gender pay gap is 9.4 per cent, but there are wide variations by age and sector.

Younger women, from 18-39, in full-time work experience a very low or even reversed gender pay gap. ONS data shows the gap for hourly earnings growing from the age of 40 onwards. It is greatest for women in their 50s. This is partly due to the fact that half of women over 50 work part-time, and hourly wages for part-time workers are significantly lower than those for full-time employees.

The gender pay gap is not confined to those working part-time though. Women over 50 working full-time earn 82 per cent of what men of the same age working full-time earn. Some of this discrepancy is down to occupational segregation. At present, two-thirds of women aged over 50 are employed in just three sectors: education, health and retail.

68% of the companies surveyed say that women make up 30 per cent or less of their workforce and there is recognition that this could cause a problem when reporting. A third (32 per cent) are up-to-speed in their understanding of the forthcoming requirements and 30 per cent are concerned about the amount of work required to provide the data.

Committee chair Maria Miller said: “The gender pay gap is mainly a problem for women over 40, and currently hits women in their 50s even harder. However, the measures already announced by the government don’t target this group. Our inquiry aims to fill this gap in government thinking. We’ll be asking about barriers to promotion; recruitment and training; problems facing women in predominantly female sectors and non-professional roles – and much more. Our inquiry will make recommendations that will tackle the gender pay gap where it hits the hardest.”

Key policies that the government has already announced include:

• every company with more than 250 employees being required by law to publish the difference between the average pay of their male and female employees
• new steps to compel larger employers to publish bonus information by gender
• gender pay reporting rules being extended to include the public sector, as well as private and voluntary organisations
• This inquiry aims to fill that gap by considering three key areas:
  1. How effective will the government’s proposals announced so far be in reducing the gender pay gap faced by women aged over 40?
  2. Are there changes to these proposals that would help to reduce the gender pay gap for this group more quickly or effectively?
  3. What could be done to improve the position of women aged over 40 regarding recruitment, retention, promotion and training? The deadline for suggestions has passed but at the time of going to print WES was hoping to contribute to the inquiry.

Ninety per cent of companies face a standing start on gender pay gap reporting

The government is currently consulting on imminent new gender pay gap reporting requirements. But, a new survey shows that less than one in ten manufacturing and engineering companies (9 per cent) currently report any gender pay information and providing data is going to be a significant challenge:

• 83 per cent of companies are aware of government proposals on gender pay gap reporting, but less than one in ten (7 per cent) are up-to-speed in their understanding
• Less than three in ten companies (29 per cent) are prepared for the forthcoming requirements and 30 per cent are concerned about the amount of work required to provide the data
• Challenges: only a third of companies (33 per cent) have undertaken a pay audit in the last five years – 27 per cent have never undertaken one while 45 per cent don’t have an official pay scale.
• Opportunity: 47 per cent see gender pay reporting as an opportunity to benchmark against peers and other industries – 38 per cent say that it will help them get to grips with their pay structures and auditing
• Context, support and a phased rollout will be key to minimising challenges and maximising opportunities, says EEF, the manufacturers’ organisation.

68% of the companies surveyed say that women make up 30 per cent or less of their workforce and there is recognition that this could cause a problem when reporting. A third (32 per cent) agree that industries struggling to attract women into skilled roles are likely to have a wider gender pay gap. This means that context must be provided when the data is published and that every effort is made to ensure that gender pay gap reporting doesn’t make it even harder to attract skilled women into industries where they are currently under-represented.

The research was conducted online by EEF in August 2015 amongst 100 UK manufacturing and engineering companies. For more information visit www.eef.org.uk

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**Royal celebrations for the Winston Churchill Memorial Trust Travelling Fellowship**

Dr. Susan Bullivant (pictured above), former WES Vice President and council member, understands the trust only too well having been awarded her fellowship in 1981 to go to the USA to study initiatives to encourage and support women in engineering. At the time Susan was a lecturer in engineering mathematics at Loughborough University of Technology (LUT). Earlier this year she attended a reception hosted by Her Majesty the Queen in her role as Patron of the Trust at Buckingham Palace.

In 1979 Susan formed a Women in Engineering Student Group at LUT and with funds from the Department of Trade and Industry (Dti) established a schools liaison initiative in which she and the women undergraduates went into schools to talk about careers in engineering. "At the time I had no knowledge of WES as an organisation", Susan recalls. However, following a visit to LUT by Maria Watkins and Peggy Hodges (former presidents of WES) the student group, together with a Cambridge University group became the first student groups to be affiliated to WES. “It was interesting to read recently that a new Loughborough Student group has just joined WES,” she said.

Susan’s fellowship entailed visiting government institutions, universities, professional bodies, industry and SWE groups along the Eastern seaboard of the US. She received tremendous support from SWE members including Evelyn Murray (a British engineer who was the SWE president) and Betty Preece (an active WES member). She was also fortunate to see the first space shuttle launch at Kennedy Space Centre.

**ROLE MODEL BROCHURE**

On her return, she and her research assistant Cynthia Onions (a chemical engineer) produced a role model brochure of women engineering students at LUT, which was funded by the Dti and LUT. This was subsequently reprinted during 1984 by the Equal Opportunities Commission and then distributed to secondary schools as part of the WISE Year initiatives.

Documents and information obtained on SWE’s corporate sponsor scheme was also developed by WES council to establish its corporate liaison membership programme which helped support WES both financially and in kind to develop its own role model brochure and other national initiatives such as its student and professional member group network. Dianne Winfield, the schools liaison manager at the IEE and WES member also developed a training pack for members to assist them on how to give talks in schools.

Susan was invited to be on the WISE 1984 steering committee chaired by Baroness Beryl Platt and undertook a survey in 1983 with Cynthia Onions for the Engineering Council on ‘Examples of good practice in schools, FE/HE and industry to encourage women in science and engineering’ to help inform its strategy for the launch of WISE Year 1984. “I was very impressed with Beryl Platt in the way she was supportive and approachable to me and her dedication and help given via her contacts and position to make WISE successful.”

**AN IMPORTANT BOOST**

Speaking about what the WCMT Fellowship meant to her in terms of self-development and making a difference, Susan told The Woman Engineer. “I felt it gave me the experience, contacts and confidence to do this and to start my own consultancy organisation. Initially I built on my experience writing career profiles for CRAC, mainly on women graduates working in engineering. In 1985 I worked with the Women in Work Unit at Aston University to develop and run a Women in IT fourteen-week programme for women with no previous experience in computing/IT. Subsequently I then raised funding for, and ran some short programmes on Women in IT and Enterprise. Later I worked with companies and educational institutes in professional and organisational change as well as research studies and project management for government departments. My last major project brought me back to a WISE initiative. I was appointed the first Athena project director taking it from concept, developing its strategy and successfully overseeing its launch and implementation. The fellowship provided a catalyst for a career change from academia to the business environment and it is still providing opportunities for me to - to meet new friends, through its regional associations and of course to meet the Queen."

As 2015 marks the 50th anniversary since Churchill’s death, the WCMT is awarding 150 travelling fellowships rather than its usual 100. Projects undertaken can be related to professional and/or personal interests and enable an individual to ‘travel to learn…..return to inspire’. The WCMT funds British citizens, whatever their background, to investigate ground breaking practice in other countries and return with innovative ideas for the benefit of people in the UK. This year’s categories included craft, design, education, environment, medicine, mental health, science, technology and innovation, housing and young people. Grants cover all travel, daily costs and insurance for overseas travel of between four to eight weeks. It is not aimed at gap year travel projects.

Although the deadline has passed for 2015 anyone registering with the organisation will receive an email in May 2016 when the application process opens for travel fellowships to be undertaken in 2017. For more information visit: www.wcmt.org.uk

Susan is enthusiastic about the possibilities: “I would encourage WES members to look and see if there is something they feel passionate about and consider applying for a fellowship which could help them make a difference to themselves, others, their community or profession on their return. Good Luck!”
ENGINEERING EMPLOYERS predict education system won’t keep up with technological change

Demand for engineers continues to rise but over half (53 per cent) of employers are struggling to recruit suitably skilled staff, says the 2015 Skills & Demand in Industry Report. Published by the Institution of Engineering and Technology (IET), the report reveals that 61 per cent of employers are least satisfied with skills among graduates - and that two thirds (66 per cent) are concerned that the education system will struggle to keep up with the skills required for technological change.

This is the tenth year that the IET has published its skills report and the role of education comes under the spotlight, together with ongoing diversity issues in engineering and a lack of both available graduates and more experienced engineering staff.

Women account for only 9 per cent of the UK engineering workforce and yet 57 per cent of employers do not have gender diversity initiatives in place.

Nigel Fine, IET chief executive, said: “Employers also need to recognise the need for workforce diversity and do more to attract recruits from a wider talent pool. This might include looking at other professions, such as medicine and accountancy that have been more successful in attracting a diverse workforce. It also means working with parents and teachers to promote engineering as a creative, rewarding and exciting profession for girls, as well as boys.”

Sheila Brown, director at South Midlands Communications, a specialist in radio, broadcast and communications products, said: “A whole generation has focused too much on the service industry instead of manufacturing, and now productivity, which has led to a gap that the next generation of school leavers need to fill.”

And on the subject of graduate recruits: “We are not convinced that universities are focused on preparing their students for the workplace. They have become funding-driven, not outcome-driven, and seem to have lost the will to link the teaching of STEM subjects to industry requirements.

“Universities appear to be more research-focused (as a revenue stream) rather than concentrating on the primary teaching function. In electrical engineering, we have noticed a trend towards focusing on electronics rather than power engineering - is this because it is ‘cheap’ to provide students with printed circuit boards and a box full of resistors and capacitors, rather than need to give practical experience on large motors, generators and switchgear?”

Fellow of the Royal Academy of Engineering

Professor Karen Holford, Cardiff University’s pro vice-chancellor, College of Physical Sciences and Engineering, has been elected a Fellow of the Royal Academy of Engineering.

The admission, one of the highest national honours an engineer can receive, recognises Professor Holford’s distinguished research career in industry and academia, as well as her commitment to outreach activities and promoting engineering as a career.

After undertaking her first degree in mechanical engineering at the University of Wales Institute of Science and Technology (Cardiff) as an undergraduate apprentice sponsored by Rolls Royce, Professor Holford went on to work as a senior design engineer at AB Electronic Products Ltd, where she led a variety of projects in the automotive field with companies such as BMW, Jaguar and Rover.

She joined Cardiff University’s School of Engineering as a lecturer in 1990, and became the school’s director in 2010. In Sept 2012, she was appointed pro vice-chancellor for the College of Physical Sciences and Engineering.

Professor Holford’s current research focuses on acoustic emission, and how high frequency sensors can be developed to monitor damage in a number of different structures and systems, such as bridges, buildings and aircraft landing gears.

In addition to her research, she is a proud advocate of engineering and is part of a number of committees and organisations that actively encourage young people to consider a career in the field.

In 2006, Professor Holford was named the Welsh Woman of the Year in Science and Technology, and in 2007 was awarded the WISE (Women in Science and Engineering) Excellence Award for her long-term commitment to supporting girls and young women in science and engineering.

On being named a Fellow, she said: “I am absolutely delighted to be named a Fellow and to be recognised alongside such an esteemed list of world-leading engineers. To receive this honour is the pinnacle of an engineer’s career and I hope it can be used to inspire the next generation to consider studying or working in the field. I look forward to working more closely with the Academy as part of the Fellowship in the future.”

As a Fellow of the Royal Academy of Engineering, Professor Holford will be engaged in a variety of activities on behalf of the Academy, supporting engineering research, policy formation, education and entrepreneurship and public engagement.
More commitment for diversity from technology giant

Following on from Intel’s announcement at the beginning of the year that it will invest $300m in diversity efforts in its own business, the technology company has now launched the Intel Capital Diversity Fund where it has committed to invest $125m in technology startups run by women and underrepresented minorities.

Rail chief demands new graduate intake reflects diverse society

Network Rail has announced it is increasing the number of engineering places on its 2016 graduate scheme by more than 50 per cent. Chief executive Mark Carne welcomed the recruitment boost but warned the company needs a more diverse workforce that better reflects the society it serves.

In a message to his 35,000-strong workforce, the chief executive said: “I am proud that we have increased the number of women joining our graduate programme to 29 per cent in the last year and to 28 per cent from black, Asian, minority ethnic backgrounds, but we have to accelerate that growth so that it better reflects the society in which we live and serve.”

Graduates can apply for around 150 places on the 2016 graduate programme. There are 80 places across the three disciplines of mechanical, electrical and civil engineering – a 40 per cent increase on the 2015 intake; with the other places split across general management, finance, property, project management, business technology, supply chain and human resources.

Engineering Qualification wins top award

A qualification linking industry with schools took the chequered flag for victory at the inaugural FAB awards to complete a great evening for the specialist awarding body for industry, EAL.

EAL’s Level 1 Foundation Certificate in Engineering Technology, mapped to F1 in schools activities, picked up the qualification of the year at the Federation of Awarding Bodies (FAB) first annual award ceremony.

It came as Carolyn Barker (pictured), EAL’s head of governance and regulation was elected to the FAB board as a director.

“Winning the award is fantastic recognition of the team’s hard work in developing the qualification and its innovative links with F1 in Schools,” said Barker. “It is a new qualification so to pick up this award is a real boost for us.

“I am also really delighted to have been elected by the FAB membership as a director of the board. I am looking forward to working with my colleagues and in widening my liaison with key stakeholders. We have the opportunity to work more closely with employers, regulators and other government departments and agencies to ensure sufficiently robust qualifications and skills development are achieved through high quality vocational education and training which remains at the heart of the skills agenda.”

The F1 in Schools Technology Challenge provides an exciting yet challenging educational experience through the magnetic appeal of Formula One. Teams of learners aged 9 to 19 deploy CAD/CAM software to collaborate, design, analyse, manufacture, test, and then race miniature compressed air powered polyurethane based F1 cars.

FAB’s chief executive Stephen Wright said: “The EAL entry had everything we could have wished for. Engineering is a key sector for the success of the whole economy however research from the Royal Academy of Engineering suggests that by 2020 we will need more than a million new engineers and technicians. The Level 1 Foundation Certificate is just the sort of qualification that can help close the skills gap, plugging into the F1 in Schools competition to introduce 15 to 18 year olds to the basic principles of engineering in an engaging and inspiring way with a combination of practical workshops and theory sessions. A well-designed qualification in a key sector makes it a very worthy FAB qualification of the year winner.”

EAL’s Level 1 Foundation Certificate in Engineering Technology has three optional units (Introduction to Computer Aided Drawing (CAD), Introduction to Computer Aided Machining (CAM) and Introduction to Engineering Project Planning) mapped to F1 in Schools activities, helping learners achieve the qualification through activities that would otherwise not be officially recognised.

It is part of EAL’s new suite of KS4 & KS5 qualifications, designed by industry experts to provide young people aged 14-19 with a seamless progression path from school to apprenticeships and industry careers.

Challenge for change issued

British engineers must start shouting loud and proud about their achievements, if they are to optimise opportunities, says the woman tasked with skilling the sector.

Ann Watson, CEO of Semta, the not-for-profit employer-led organisation ‘engineering skills for the future’ believes that the engineering community is guilty of concealing abilities.

Addressing the Society of Operational Engineers she said: “As an engineering community we need to stop hiding our lights under bushels, start blowing our own trumpets and herald what a fantastic career engineering can be.”

She said that young people needed to know what wonders await in a career in engineering, and she mourned the loss of STEM graduates choosing careers outside the sector.

“The problem we have is that too many are choosing to apply their skills outside of STEM sectors. More than 12,000 engineering graduates are working in financial services, for example – that’s undoubtedly good news for financial services!”

She bemoaned inadequate careers advice, which she said is part of the problem. “Only 10 per cent of educators feel confident in speaking about an apprenticeship. Too many teachers have never set foot in a modern engineering workplace.”

Companies can sign up to Semta’s STEM Exchange to offer opportunities for educators to be educated about the world of work in the sector.
New CHAMPION on board

WES is delighted to welcome Professor Isobel Pollock
OBE BSc (Eng) CEng Hon DSc FI MechE FCIGI as our
new patron.

Prof Pollock has championed the importance of
engineering for over 30 years and was awarded an
OBE for services to mechanical engineering last year
after a career that includes working in world-leading
multi-nationals and making major contributions to the
promotion of engineering.

She is of course a familiar face to many of us having
been present at a number of WES conferences and
events and she has worked with young people to
encourage sustainable and innovative design through
the Audi Design Foundation, the Bloodhound schools
outreach project and the Design and Technology Association.

WES’s Dawn Bonfield said of the appointment: “Isobel was a natural choice for
us and I am delighted that she was able to accept our invitation to be our patron.
She has so many great accolades to her name, many of which have involved
bringing engineering to new audiences, something WES is very passionate about.
I know she will be great champion for our cause.”

She is the second female president of the Institution of Mechanical Engineers
and soon, subject to election, will become the first female Master of the Worshipful
Company of Engineers.

WES is grateful for the support of our four other patrons: Professor Dame Ann
Dowling FREng, Meg Munn, Sir Robert Malpas CBE, FREng, Professor Patrick
Dowling CBE, DL, FREng, FRS.

A more detailed profile on Prof Pollock will appear in a future issue of The
Woman Engineer.

WES would like to thank the
Student Conference headline
sponsors - BAE Systems,
Dialog Semiconductor, P&G and
Selex ES and the conference
sponsors Aston University, BP,
Finning, Instron, Mars Petcare
for their support for the 2015
WES Student Conference held
on 20th to 21st November at
Aston University. We also thank
all our volunteers, speakers and
delegates for their continued
support. A full report on the
event will be published in the
next issue.

Plea to TEACHERS

Anyone teaching young girls who have an
interest in CRESTA (creativity, engineering,
science, technology and art), can sign up to
Sparxx, and should encourage students to sign
up too. Our aim is to ensure that news, events,
competitions, freebies and much more are
brought to the attention of engaged girls to help
retain their interest. Sparxx seeks to inspire their
future choices.

CRESTA events, competitions, games or
quizzes, will also feature so please email
relevant content to WES with the subject line
Website Content.

To sign up to the Sparxx monthly e-newsletter
or for more information visit: www.sparxx.org.uk

New Members:

Ebru Avcioglu, Eileen Banks, Sukhpreet Bansal, Jenny Barna, Rachel Barrett,
Rebecca Bennett, Jo Bray, Annette Brookes, Ivanka Brown, Nancy Campuzano,
Samuel Carter, Sophie Cartwright, Esperanza Castro Martin, Gemma Christie,
Stephen Clarke, Sarah Clayton, Chiaki Crews, Ioana Dikanska, Hazel Easton,
Emma Faulkner, Julie Forbes, Rachel Graham, Sarah Granger, Michelle Grant,
Liz Griffin, Poppy Howe, Elizabeth Hutchinson, Kristin Ivanova, Alessa Jaendling,
Scarlett Jenkins, Susan Jones, Shilpa Joy, Laura Justham, Catriona Kelch, Ziaena
Koppernaes, Dia Kombrot, Georgia Kremmyda, Blinne Lappin, Dawn Love,
Alisa Magar, Stephanie Malyon, Kate Marks, Lauren McGarry, Katie Meredith,
Rachel Nicholls-Lee, Ajoke Onojeghuo, Keletso Orapeleng, Gillian Passman,
Dominque Pitman, Helen Randell, Yoana Romeo, Jemma Rowlandson, Jessica
Sailesbury, Samira Salmim, Deanna Sharma, Hannah Short, Suzanne Smith,
Natasha Stevenson, Nicola Telck, Lucie Thaxter, Helen Thomas, Emmie Thrush,
Kimberley Travers, Helen Tresadern, Charlotte Tyler's Hunter, Patricia Verrier,
Maria von Prittwitz und Gafron, Helen Wade, John Walker, Mackenzie Walker,
Serén Wilson, Wanda Wojciechowska, Louise Wood

Corporate Partners

BAE Systems is the first WES Member
to renew their Event Partnership. As
Event Partners, BAE Systems has helped
ensure success at all WES events and
conferences over the past year. Malvern
and Mars Petcare have also both renewed as
Company Members and RAEng continues its
support of WES as a Not For Profit Member.
All the support from our partners provides
the much-needed funds and impetus to
help WES deliver various programmes and
events. We’d like to extend our gratitude
to all our current members who make this
possible.

For more information on Partnerships with
WES, whether through membership or
sponsorship, contact: corporates@wes.org.uk

Stop press…

At the time of going to print WES had just
been announced as the winner of the WISE
Campaign Award (sponsored by Network Rail)
for National Women in Engineering Day. This
is a huge achievement and real recognition
for the event from the broader engineering
world.

Two WES Corporate Members also
won awards; Kris Harrison, head of lean
engineering at Selex ES picked up the WISE
Inpiring Young People Award (sponsored
by Atkins) and Amrita Ahuwalia, professor
of vascular pharmacology, William Harvey
Research Institute, at Queen Mary University
of London won the WISE Research Award
(sponsored by Thales).

More information will be published in the
next issue of The Woman Engineer.

Royal Aeronautical Society
support

WES is delighted to announce that it has been
awarded £3,000 from the Royal Aeronautical
Society Centennial Scholarship Fund towards
the Magnificent Women in their Flying
machines outreach activity.

The activity provides resources for schools
and other organisations based on building
aircraft wings designed to replicate the work
that was undertaken by women during the First
World War. It allows schools to combine the
design and technology aspects of creating and
building authentic wing structures out of Stixx
(rolled up newspaper), with the pioneering work
of women in engineering over the past 100
years, the scientific aspects relating to wing
design and flight mechanics, team working
skills, careers advice relating to the modern day
work of aerospace engineers highlighted by
role models, and the history of World War One
including the rise of the suffrage movement.

For more information on the activity visit
www.magnificentwomen.org.uk

We thank the Society for its continued support.
Senior Members’ Lunch

WES is pleased to report that the Senior Members’ Lunch held in Birmingham on 10th October was a great success. Not everyone attending would necessarily describe themselves as ‘senior’ but there was certainly an abundance of experience amongst the 17 women taking part with more years in WES membership than anyone would care to count.

Nine past Presidents, past committee and council members caught up with personal affairs, business and current preoccupations whilst enjoying a pleasant meal with wine to oil the larynx and a substantial sugar hit by way of the dessert. Eleven other long-term members had sent their apologies and good wishes, inspiring a wave of nostalgia for those not present.

The lunch was good fun - no need here for a facilitator to encourage discussion with lots to talk about. In the afternoon the participants joined the other members of WES for the AGM, which was beneficial and good wishes, inspiring a wave of nostalgia for those not present.

The lunch was good fun - no need here for a facilitator to encourage discussion with lots to talk about. In the afternoon the participants joined the other members of WES for the AGM, which was beneficial to everyone. As would be expected there was a good deal of interest in the 100th anniversary, ideas to be pursued and perhaps some will volunteer their services.

Sue Bird and Linda Maynard, who organised the lunch, have taken on board feedback that the lunch should be repeated in the not too distant future, so watch this space.

WES Student Group launched at Sixth Form College

It was a first for WES when on 2nd October 2015, a WES Student Group was launched at Welbeck Defence Sixth Form College (DSFC) in Loughborough - the first time a group has been set up at a sixth-form college.

This groundbreaking initiative was organised and set up by Lisa Hawkins, a WES member who works at the college.

Welbeck DSFC specialises in preparing students for a technical or engineering career. This may be as an officer within the Royal Navy, Army or Royal Air Force or as a civil servant within the MOD. As part of the Defence Technical Officer and Engineer Entry Scheme (DTOEES), the students study STEM subjects at A-level at Welbeck and then move on to one of eleven partner universities to study engineering and technical degrees.

The launch was announced to the students by the principal, Peter Middleton before WES Past President and Welbeck governor Sue Bird spoke to the students about WES. Sarah Hainsworth, professor of materials and forensic science at Leicester University, a WES Fellow, then gave a presentation on her work, including that in the automotive industry investigating mechanical properties and failure mechanisms of coated components, and also of tool mark analysis and stabbing investigations, which were used in the recent examination of the skeleton of Richard III. Prof Hainsworth also answered questions from the students and gave some invaluable advice about their future careers as engineers.

After the formal part of the event, tea was taken by about 30 Welbeck students who talked to Prof Hainsworth and other women engineers who were present, including past Welbeck students, and members of the WES group at Loughborough University.

The group has already planned its first outing to the Space Centre at Leicester University.

The winner of the WES Prize will be announced and presented at 2015 Young Woman Engineer Awards ceremony on 3rd December at the IET in Savoy Place, London. The prestigious awards honour the very best early career female engineers working in the UK.

For more information visit: www.theiet.org/ywe/
Two engineers at Ricardo chose WES as a charity to fundraise for, as part of their company’s one hundred year anniversary celebrations.

DRIVING AMBITION

Having raised £355 from various activities, including a quiz night, treasure hunt, work mufti day, driving challenge and half marathon, Oliver Adams and Adam Drury are delighted that their employer Ricardo agreed to match the funding making a total of £710.

Speaking to The Woman Engineer, Oli said his girlfriend Lizzy Adam and the male dominated environment at university was the catalyst for selecting WES as his chosen charity. “My girlfriend has always championed equality and I was so amazed at university to be surrounded by men. I found it really frustrating that some people don’t realise what opportunity they have. I am really inspired by the fact that WES encourages everyone.”

Oli’s route into an engineering profession was he says inevitable: “It started when I was very young and just wanted to build things or take them apart and see how they worked. It’s an important profession and we need more engineers so we need more women to be given the opportunity.”

Founded in 1915, Ricardo is a global engineering, strategic and environmental consultancy. The company employs over 2,700 engineers, scientists and consultants around the world.

In the transportation and security industries the company designs and develops engines, transmissions, hybrid and electric systems, right through to complete vehicles. Ricardo has a niche manufacturing and assembly capability which delivers finished products to motorsport, aerospace, defence and other high performance industries.

In the energy sector the company focuses on low cost sustainability and engineers solutions for conventional and renewable power generation, energy storage and distribution and in scarce resource and waste services they deliver environmental consulting focused on air quality, chemical risk, climate change, resource efficiency, water and waste management.

WES AGM hailed a great success

The WES annual general meeting, held at the IET offices in Birmingham on 10th October, was a great success and we would like to thank everyone who took part. We were delighted to welcome our nine new Council members.

There was an excellent presentation from Henrietta Heald on WES founder Lady Rachel Parsons, which was followed by a lively question and answer session.

During the day, the Isabel Hardwich Medal was also awarded to Carol Marsh and Anne Wiseman - two council members who are stepping down after long service. Carol and Anne have worked as volunteers for WES for many years and it was a fitting occasion to recognise the service they have given to the Society.

WES also announced Sophie Parsons as the winner of the Gillian Skinner Award for 2015. Sophie won the award in recognition of the work she has done running the ‘She’s an Engineer’ feature on the WES website.

More information on WES awards can be found at www.wes.org.uk

Building bridges with fellow engineers

Taking place on 4th November in the home of the Institute of Civil Engineers in the heart of Westminster, attendees of this year’s WES Prestige Lecture saw civil engineer Helen Randell being presented with the Karen Burt Award (refer to the front cover of this issue for more information on Helen).

There followed three lectures about bridges of the past, present and future. Sue Threader (pictured), bridge clerk from the Rochester Bridge Trust spoke of the fascinating history of bridges, which inspired the audience to find out more. Sandi Rhys Jones focused her presentation on Waterloo Bridge, sometimes called the Ladies Bridge, and launched a campaign for a sculpture by Barbara Hepworth to be installed on the bridge to commemorate the work of the women who were drafted in during World War II to construct the bridge. She also took the opportunity to present various ways in which to garner interest in the subject and in engineering in general.

Caroline Tong gave a presentation on the future of bridges, looking at their importance for communities in the developed world and sharing designs of modern bridges that focus on giving the user an ‘experience’, as well as being functional.

The feedback from attendees on the calibre of speakers and quality of the presentations was particularly pleasing, quoting one delegate: “There were a variety of speakers who found an interesting interpretation of the subject matter and didn’t just spend 20 minutes stating the most obvious.”

There was also great praise for Helen Randell’s acceptance speech where she recounted her experiences and provided a “stand out” moment for some attendees.

The excellent speeches were just part of an evening which included ample networking and socialising opportunities.

WES would like to thank all concerned and encourages more members to look out for next year’s Prestige Lecture.