

## Distressing lack of know-how about women engineers

**A SURVEY TO MARK** International Women's Day has revealed that a startlingly low percentage of the population can name a woman engineer. Just 35% of nearly 1,750 people surveyed could name a senior woman engineer, even though nearly 70% of the survey participants were engineers or worked with engineers. Of the non-engineers polled, the number dropped to less than 20%.

The woman named most often was Jean Venables, a civil and public health engineer (shown right). She was both delighted and surprised.

The survey participants were also asked to name any famous engineer (living or dead). Nearly

half named Isambard Kingdom Brunel.

The only woman to make it to the top ten list of any engineer (living or dead) was Ada Lovelace.

The top ten women engineers named were: Jean Venables, Marie Curie, Ada Lovelace and Grace Hopper, US computer scientist and navy officer.

In 5th and 6th place were WES members Professor Dame Ann Dowling and Professor Julia King. They were followed by Hedy Lamarr, US actress, scientist, mathematician and inventor of spread spectrum communications, computer scientist Professor Dame Wendy Hall and structural engineer Jane Wernick.



In final place was WES member Professor Dame Julia Higgins.

[www.theukrc.org/about-us/our-projects/ingenious-women/home-an-engineer-survey-results](http://www.theukrc.org/about-us/our-projects/ingenious-women/home-an-engineer-survey-results)

## the president's message



**Jan Peters WES**  
President reports on the latest WES developments

The dust following the spending cuts begins to settle and we are all looking hard at how we can strive to survive. The focus for WES has been MentorSET – our personal development programme supporting women in STEM through career transitions. Starting out as a partnership between WES and AWISE, MentorSET is continuing thanks to the legacies of previous WES members and careful management. MentorSET (through WES) was also the selected recipient of the remaining funds of national AWISE, a fitting place as the founder of AWISE was a WES member and long term supporter of boosting women's careers. The MentorSET event programme wasn't ready for this journal but details will be announced soon.

It is vital that you take note of this year's conference and book your hotel and workshop early to keep your conference costs down! We are delighted to be working in association with the Women's Transportation Seminar (WTS) on Getting There – connecting and inspiring women in road and rail.

WES volunteers and activists are too numerous to mention, but without you the Society's work would not happen. I'm really pleased to announce we have a new web mistress in Aniuska Dominguez and also a web editor in Karyn Thompson. They will be working together to improve the web content and support.

We always need more volunteers and expertise! Our Editorial Board is looking for new blood as some long serving members retire. As this is where I cut my 'WES teeth' I can recommend it as a great way to add an interesting dimension to your CV and get to

.....continues on page 2

## Don't erase women from engineering history

AT THE END OF APRIL WES member **Carolyn Dougherty** posted a blog on the UKRC site on the subject of opposing the erasure of women from the history of engineering.

Carolyn was inspired to study engineering in her second year at Berkeley when she read Harry Harrison's novel *Tunnel Through the Deeps*.

She believes that history is obliterating the inspiring examples of women's contribution to engineering and that this should be redressed to enable women to be inspired by reading about women's historic roles.

Carolyn wrote: "Years ago I acquired a small diary called *The Medieval Woman*; each week has an image from a book of days, illuminated manuscript, or border of a painting or document. They show women doing tasks such as spinning, baking, cleaning, farming, and others we now find surprising – fighting, writing, mining, blacksmithing, working in construction. Women have always



been involved in the world's business, but in more recent times have been written out of the history of anything arbitrarily labeled 'masculine', such as science and engineering.

Over the years I have found evidence, often indirect, about several women engineers before the 20th century – Sarah Guppy, Alice Tredwell, Elinor Coade, Sara Losh, to name a few. I'm certain that these are only representative of the countless women who have

done what we would call engineering throughout history but whose contributions have never been acknowledged and have now been lost.

What interests me is not necessarily highlighting the lives and achievements of individual women, but rather combating the resistance to the idea that women, as people, are legitimate actors on the world's stage – not just a few praiseworthy exceptions, but all of us."

Carolyn's blog produced many interesting comments. One female engineer pointed out that working class women had always done masculine tasks but history tended to judge society by what middle and upper class women did. Several respondents mentioned the UKRC survey that uncovered a depressing lack of knowledge about women engineers.

<http://www.theukrc.org/blogs/getset-women/2011/04/opposing-the-erasure-of-women-from-the-history-of-engineering>

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## Overlooking women's technical achievements

In this issue we celebrate significant achievements made by women engineers. However, despite the national and international recognition for outstanding women engineers, a survey on International Women's Day discovered that only 35% of the public could name a women engineer. This was despite the fact that many of those surveyed worked in engineering. The most frequently identified engineer, of either sex, was Isambard Kingdom Brunel. Does this mean that we have to wait another century before the contributions that women engineers are making to our technological development are recognised? How many people know that a woman engineer led the refurbishment of St Pancras or the building of Terminal 5 at Heathrow?

Denying women's technical prowess is by no means a new phenomena. Carolyn Dougherty's recent blog on the UKRC site points out that in the Middle Ages women worked in construction and mining

and as blacksmiths – facts conveniently overlooked by history. Respondents to Carolyn's blog identified women engineers in the recent past who were now forgotten. Has anyone any ideas what more we could do to blow our own trumpets – and not be frightened of doing so?

The right champion can achieve a great deal as the Women of Steel article on pages 6-7 shows. A journalist on the *Sheffield Star* uncovered the story of these women's achievements in keeping industry running during the war. The *Star* championed their story and they received national media coverage and lunched at 10 Downing Street. Makes you wonder



doesn't it?

Pat

Pat Battams – editor

■ Next issue contribution deadline: 15 Sept 2011



# INWES

www.inwes.org

INWES President Sue Bird describes recent developments

## My farewell to INWES

ICWES15 will be happening in a short while now (19 July), and I hope I shall see as many of you as possible there.

At that meeting I shall step down as President, and hopefully that role will fall to another part of the world and another culture, so INWES may change its character somewhat.

We have a number of WES members standing for election to the INWES Board, so WES will carry on its influence on the organisation.

Although we are now concentrating on ICWES, we have recently recruited a company member (L'Oreal) and a couple

of university members, and we hope this recruitment drive will continue in Adelaide.

### Shared parental leave

PARENTS, not government, should decide who looks after their baby, says the TUC.

Responding to plans outlined by the Deputy Prime Minister to extend shared parental leave, TUC General Secretary Brendan Barber said:

"The UK has the most unequal parental leave arrangements in Europe so extending the previous government's shared leave plans is welcome.



the president's message  
cont....

know others. Meetings are few and travel paid. Council nominations are also called for in this issue and we have a number of vacancies for regional groups and would welcome representatives on Council from the regions, especially North West, Midlands, East and North East.

Council is a friendly group and with our multinational backgrounds ensure a lively mix of conversation and views. So don't put it off, get involved now!

Jan Peters

"New parents should be able to decide for themselves who looks after their baby in the first year, rather than having the decision dictated by government regulation, as is currently the case."



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The views expressed in this journal are not necessarily the views of the Society.

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## Top international recognition for Helen

**Professor Helen Atkinson from the University of Leicester has received yet another top recognition in her outstanding international career as a metallurgist and materials engineer.**

HEAD OF THE MECHANICS of Materials Group and Professor of Engineering at the University of Leicester, Professor Atkinson was awarded an honorary degree by the University of Liège in Belgium.

I have been fortunate to work with excellent teams throughout my career. Metallurgy is a wonderful subject; metals are critical to our everyday lives so anything we can do to improve understanding is important."

Head of the Department at Leicester, Professor John Fothergill added:

"I was very pleased to see that Helen Atkinson received this honorary doctorate. She is internationally renowned as an engineer in the area of metallurgy and her vision and energy means she is a great inspiration to engineers across the UK."

Professor Atkinson is passion-



**"Engineering is behind everything our life depends on.....We can't function as a society without engineering and a lot of women don't realise how creative it is."**

Her research is focused on how to form semi-solid metals, which has a widespread use in industry for making mobile phone cases, laptop cases and parts for cars, and helps to save energy and costs.

She has already reached the top in the UK by receiving the highest honour an engineer can get, a Fellow of the Royal Academy of Engineering, and being named as one of the UK's outstanding women by the UK Resource Centre for Women in Science, Engineering and Technology. Earlier this year she became President of the Engineering Professors' Council (EPC)\*, the first woman to hold this post in its fifty-year existence.

Whilst the existing awards demonstrate her excellent national reputation, the honorary degree strengthens her position as the crème de la crème internationally.

On receiving the award, she commented. "I feel very honoured to be associated with this prestigious University in Belgium.

ate about engineering education and works hard to encourage more women into the profession. She has said, "Engineering is a wonderful career for women to go into.....Engineering is behind

everything our life depends on.....We can't function as a society without engineering and a lot of women don't realise how creative it is and how much it is a people-centred career."

*\* The key EPC objective is 'to make the excellence in engineering education more widely known.'*

*To learn more about its work, see [www.epc.ac.uk](http://www.epc.ac.uk)*

## Engineers welcome budget's emphasis on skills



EUROPE'S LARGEST ENGINEERING institution has welcomed measures contained in the UK government's budget to support engineering as part of its plan for economic growth.

The Institution of Engineering and Technology (IET) is particularly pleased that there will be additional funding for University Technical Colleges (UTCs)\* and apprenticeships.

The government's announcement of £180 million for up to 50,000 additional apprenticeship places over the next four years will go some way to bridging the current skills gap. A pledge to expand the UTCs programme and establish at least 24 new colleges is also welcomed.

"The announcement on UTCs is great news," said Dr Tony Whitehead, director of governance and policy at the IET. "Key to their success will be how they are perceived. The great thing about them is that everyone, including universities and employers, are taking them seriously as a robust, enjoyable way of developing skills."

"We particularly welcome the support for business consortia to set up and maintain advanced and higher apprenticeships schemes, supported by grants, creating a further 10,000 apprenticeships."

The IET is also delighted that the government has announced a new international prize for engineering. With the active backing of UK industry, it is hoped the prize will inspire a renaissance of engineering achievement, which is essential to create sustainable economic growth.

*\* UTCs are college for students aged 14 to 19 which specialise in technical studies and are sponsored by a university. They offer full time courses which combine practical and academic studies.*



## Piece of cake

TO MARK THE IET's 140th anniversary on 17 May, IET chief executive, Nigel Fine cut a special celebration cake.

The IET, Europe's largest professional engineers' body, hosts the WES office at its Stevenage headquarters.

The Institution started as the Society of Telegraph Engineers on 17 May 1871 at a meeting held in London attended by eight people. Today it has over 150,000 members in 127 countries around the world.

The majority of IET's over 500 staff work at Michael Faraday House in Stevenage, which opened in 1991.

Cake ceremonies also took place in IET offices in London, Birmingham, Glasgow, Hong Kong, Beijing, and Bangalore. Further celebrations are planned over the coming months.

## Young Engineer for Britain 2010-2011

YOUNG ENGINEER FOR BRITAIN encourages students, aged 12-19, to use their imagination to create, design, develop and manufacture an original idea for a commercially viable device or system that could be an everyday task, meet a social need or simply a brilliant innovation. Top projects often become commercial successes.

The results of the Young Engineer for Britain 2010-2011 National Final competition were announced at The Big Bang Fair, Excel, London in March. Kate Bellingham and Professor Brian



Cox hosted the Award Ceremony.

The projects at this year's event were fantastic, the students amazing and it was a very real battle for the judges to decide the winners with so much talent to choose from. Eventually, they reached agreement. The Young Engineer for Britain female prize winners were declared as follows:



**YEB Intel ISEF Nomination** (a week-long trip to Los Angeles) – **Roxanne Pollard**, Chipping Sodbury School, Bristol for *Bicycle Safety Helmet*, a cycling helmet that allows the user to indicate presence and driving directions whilst keeping full control of the bike.

**YEB Overall Runner-Up Group 3 (age 12-14)** (£300) – **Casey Turner, Leigh Roberts, Darcie Lacey & Martha Gregory** (shown above), Maltby Academy (for *Trickii Twister*, a skills game that does not use batteries but will develop hand eye-coordination skills).

**YEB Award for Product Development and Marketability (age 14-16)** (£400) – **Emily Bentley**, Hymers College, Hull for *Teddy Bear Child's Alarm*. A lost child alarm that was originally designed and built for a mentally handicapped child. The product triggers a melody if the child strays too far away from the parents.

## National Science and Engineering Competition winners

THE COMPETITION is open to 11 - 18 year olds and seeks the "best of the best" from every area of science, technology, engineering and maths (STEM). There were over £50,000's worth of prizes at stake for both individuals and teams. Prizes included cash and trips abroad. All prizes are sponsored by the Department for Business, Innovation and Skills.

The winners were announced at the Big Bang Fair. Prizewinners from the Young Engineer for Britain also featured in this competition.

### Young Scientist of the Year

**Hannah Eastwood** from Coleraine in Northern Ireland has become the first-ever female winner of one of the top titles with her project that explores how chromium can be removed from drinking water, in order to purify tap water and reclaim the metal for the steel industry where it is a valuable resource.

Hannah commented, "I'm still in shock but so thrilled. This is an unbelievable opportunity to be an ambassador for science and to inspire young people. I'd encourage all young people to

take part in next year's National Science & Engineering Competition as it's such a great opportunity."

### Young Engineer of the Year

The UK Young Engineer of the Year title went to **Andrew Cowan** from Sutton in Greater London for his Search and Rescue Robot.

This low-cost project includes a camera and fire extinguisher that allows the user to control the robot and view environmental information from a remote control panel.

## Karen Burt Award 2010

THE WINNER OF THE 2010 Karen Burt Award is **Julie Templeton**. Julie received her award from Karen's father Cyril Hilsum at the Crossing Bridges event in February. This award, in memory of Karen, is made to the leading female newly Chartered Engineer. Julie was nominated her institution, the Institution of Civil Engineers.

Upon receiving the award Julie said "I'm really delighted and honoured to have won the Karen Burt Award. I knew there would be stiff competition and I didn't have any expectations that I'd win. It is very rewarding to take part in the various programmes and initiatives to encourage children/ women into engineering and be recognised for doing so. Winning the award has helped me meet some wonderful people from other organisations where I wouldn't ordinarily have made contact.

Water engineer Julie works for the Rivers & Coastal Team in the Atkins Belfast Office.

"I perform flood alleviation studies, design and management of flood alleviation schemes and flood risk assessments for commercial and residential developments," said Julie.

"I am currently managing the construction phase of the Lodge Burn Flood Alleviation Scheme in Coleraine, Northern Ireland.

"I have always been interested in science and technology and how things worked. This led naturally into a career in engineering. I have wanted to

be an engineer since I was 14. I couldn't see myself doing anything else."

Julie's initial inspiration came from her P7 teacher at primary school.

"Her enthusiasm for science was infectious and her way of teaching made learning science a real adventure. This passion for science and how things work has remained with me ever since."

Julie loves her job.

"I enjoy the variety of work; day-to-day activities change and you can spend time both in and out of the office. It is very rewarding to see something you have planned on paper come into existence in the real world."

In her free time Julie is busy as an ICE graduate ambassador.

"I have hosted several stands at school careers fairs and given presentations to schoolchildren about a career in civil engineering. I have also taken part in delivering a



● Julie (left) with Jan Peters

## An early love of engineering

**"Engineers and other specialists within the industry need to educate careers teachers on the various career paths as well as targeting the school children themselves."**

variety of schemes/events for the ICE such as the ICE Bridges to Schools Programme (construction of a cable-stayed bridge by

school pupils under the supervision of graduate ambassadors) and the ICE Civil Engineers to Primary Schools Programme (a semester long project with a civil engineering theme where graduate ambassadors are assigned to assist each primary school).

"My involvement with ICE as a graduate ambassador provided the training and registration required to become a STEM (Science, Technology, Engineering & Maths) Ambassador with Sentinus in Northern Ireland. With Sentinus, I have hosted interactive activity stands at STEM Experience Events, given presentations to school pupils of all ages, and acted as an engineering judge at the STEM Young Innovators Event and FE colleges BEST Awards.

"I have made links to the NI Council for Curriculum, Examinations and Assessment (NICCEA) assisting them with the development of an online mathematics resource with

industry application for Key Stage 3 students and participated in a STEM project with Rainey Endowed School for the NI Curriculum STEM Works website."

Julie is keen that the civil engineering industry should do more to educate girls on the variety of careers available.

"The industry relies on people with many engineering specialisms which are not well publicised," she said.

"Engineers and other specialists within the industry need to educate careers teachers on the various career paths as well as targeting the school children themselves. These careers teachers can reach many more children over the years than single visits to schools by engineers. The earlier children learn about the possibilities of a career in science and engineering the better."

Julie and husband Kyle share their home with two cats. Both Julie and Kyle enjoy travelling and have visited America, Hong Kong and Thailand in recent years.

"We also have a passion for Formula One and will spend many a Sunday morning/afternoon glued to the TV watching the latest race. We plan to go to an actual race next year.

"Another hobby of mine is reading. I really enjoy historical fiction books and particularly like Valerio Massimo Manfredi, Tim Severin and Christian Jacq."

# Sheffield's Women of Steel

*Dianne Patterson interviews Sheffield's Women of Steel, who spoke about their experiences at last year's WES conference*

*"In 1940 (at age 20) I left Viners, where I worked as a French polisher, and I became a sand miller in a foundry among all the men and the muck and the smoke and the flames from the Bessemer converters."* This is Kit Sollitt's story of her war work in Sheffield's steel industry.

I worked in the steel industry for fifteen years as a systems automation engineer. So I was delighted to see reports in my local media of a search for the women who worked in Sheffield's industry during the second world war. Many other war workers have been remembered and their contribution celebrated, but not those who worked in the factories. Engineering, as ever, is the forgotten profession!

Nancy Fielder of the *Sheffield Star* has done a wonderful job of finding over 250 women who have contributed their stories. Most are now in their 80s and 90s, and all have been delighted to remember their experiences that are now recorded in a *Star* publication.

With WES fortuitously organising its 2010 conference in Sheffield, it seemed an unmissable opportunity for WES members to meet with and celebrate the achievements of these women who come from the generation that inspired the founding of our society.

Through Nancy, I was able to contact and

The women that I met were:

**Kit Sollitt:** Worked as a Sand Miller, and later as a Core Maker at Hardy Patent Pick foundry.

**Kathleen Roberts:** Worked for Metro Vickers who made parts for spitfires. She had various roles in the steel mill, including machine maintenance.

**Ruby Gascoigne:** worked at WT Flather's Standard Steelworks, firstly in the rolling mill and later in the test house working on the D-Day Mulberry Harbour (though that was secret at the time).

**Dorothy Slingsby:** worked as a crane driver at English Steel Corporation, on a 20 ton crane in the foundry.

**Marjorie Neal:** Worked as an electrician at Avro, wiring instrument panels for Lancaster Bombers.

**Jean Harrison:** worked for Rover, building Rolls Royce engines for the Lancaster bombers.

interview six of the women. I have to say that I fell in love with all of them. This opportunity came at a time when I had been ill for a long time and was feeling very low. The energy and stories of these women really lifted my spirits. They are 30-40 years older than me,

● Dianne (left)



but I felt like the oldest person in their company.

I noticed that they had many things in common, for example: joy in their memories and in their life, large families still in

close contact, children who have achieved great things (such as directors, magistrates), strength of character and determination. Some of them still cook weekly for their whole family. Two of them have written books about their life stories. One of them (Kit) delighted in flying down to London and back in her son's Cessna for her 80th birthday. Another (Marjorie) creates some amazing decoupage pictures. I found them all truly inspiring.

Most of the women had no choice about working during the war. Some loved it and some hated it, but it was an experience that they all remember with intensity. For the women I met, 2010 has been a momentous year. They have been to the Foreign Office and Downing Street to meet the Prime Minister. There have been civic celebrations with the Mayor at the Town Hall, numerous interviews, films and invitations to special events. They have been involved with projects remembering the Sheffield Blitz, recording experiences of wartime weddings and even restoration of ancestral homes.

*In January 2010, Sheffield MP Richard Caborn organised a day in London for some of the women to be honoured by the government. East Midlands trains renamed the train 'Women of Steel' in their honour and gave them a champagne reception*

● From left to right:

**Kathleen Roberts, Kit Sollitt, Ruby Gascoigne, and Dorothy Slingsby,**  
(photo courtesy of the *Sheffield Star*)



## Kit's story

I WAS SENT FIRST to Moore & Wright who made micrometers and all sorts of gauges for engineering. My job was assembling ratchets and it was so boring it was untrue, the same job day after day and I started with migraines. So I went off sick and my doctor gave me a note to say the job was unsuitable.

I went back to the labour exchange and I told them I would like to have a job with no tram fares. So I was found this foundry on Little London Road called Hardy Patent Pick Ltd. They'd got the Bessemer converters and the foundry all in. They did pit work and all things for agriculture in peace time so they were soon switched over to war work.

The job I got was working as this sand miller. Now, there were two mills – a man worked one, and the other was mine. I was given overalls, pair of clogs and my cap with a hairnet, and shown by a man for a week. I was learnt how to push a barrow, I don't think I'd ever took notice of one before, and outside there were things like horse tables but all in brick buildings.

They were all full of different types of sand and you had to go out there and you were given a certain shovel – so many shovels of white sand and so many of red, one for white powder and so many of that – they'd have it all down on a sheet. And there were other special powders, like

glass, depending on what was coming, and you chucked that on top. You then wheeled it into the foundry, shovelled it all into this mill and set it going. It would run for about quarter of an hour. Some of the moulders were very funny – you had to go tell them it was ready and they had to come and feel at it and see if texture was right. The others didn't bother, they just said "do us a mix" and that was all. Then you would have to do the mix and wheel it down the foundry under the Bessemer with all the sparks coming.

Sometimes I had to put a damp sack over my body to run under the sparks. Well you can imagine the burns I got – loads on my feet, and burns all up my arms. They never go away, though they've faded and they have got a bit smaller.



● (image from Wikipedia, [http://en.wikipedia.org/wiki/Sand\\_casting](http://en.wikipedia.org/wiki/Sand_casting))

I did that for about 3 years, and then I went to the core shop. It's all different kinds of shapes to whatever shape the casting was going to be. The men would make the moulds that were the outline. You would make the core that fitted inside, all differ-

ent shapes. You had to put steel rods in to hold it together, but it was so stiff this sand, when you went like this with your hand it would stay in a lump. You made so many per day, all different. They made everything – parts for tanks, parts for battleships. So that was my trade.

The core shop was full of women. The big stuff there would have four people working on it – all women. If it was too big to go into the oven we would have to put a flame on it. I really enjoyed it, it was like making pies!

There's a photo in the *Star* book of all the women working at the foundry. There was only one miller, which was me, there were a lot of foundry ladies, and a lot of truck drivers, those in overalls were office staff. If you didn't turn up for work, a woman would be banging on your door before dinner. If you had three days off you had to get a doctor's certificate, and if you were off without one you had to face a labour exchange.

Our visit to London earlier this year [2010] with the Women of



Steel group was a wonderful day, though it was snowing a blizzard. We went in the Foreign Office first – now they will never get any spies in there I can tell you. All the things you've got to do to get in. You are frisked, your bags are searched, you have to go to a hall and your photographs taken and pinned on you. We had to go through miles of offices and corridors, and at every door there was an intercom and the person stood there checks your badge and calls to say who was coming through the door. They checked your badge all the way through until we got to the office of Kevan Jones, Minister for Veterans. Then we went into Downing Street, where we had lunch. We met Gordon, and he was a lovely chap.

## Novelist and historical researcher

Kit was full of stories: the way of life in the 40s (eight children living in a two-bedroomed house above the chip shop run by her mother; her father's illness and treatment as a result of working on grinding stones; her father's experiences as a shop steward). She has written two fictional books based on her life and experiences, one of which was the first book published by the *Star* newspaper.

When I thought we'd finished, she started telling me about her visits to Stoke Hall before the war as a French polisher. The hall was owned by the chairman of Viner's where she then worked. She stayed there for two weeks at a time to do all the work needed. She was

on her own a lot and got very bored, so she researched the history of the hall and of the ghost Flora. This year she has been invited back there by a television company to participate in a film about renovating ancestral homes. So she's been back and thoroughly enjoyed seeing what's been done to the hall in the last 70 years.



The story of all the Women of Steel and of Sheffield's bid for them to be recognised by the government is in a book, produced by the *Sheffield Star* newspaper. It is available

from the website below at a cost of £12.99. <http://www.thestar.co.uk/lifestyle/star-shop>

### Sheffield's Memorial to the Women of Steel

Sheffield Council has committed to the commission of a statue to commemorate the women. They have been involved in meetings to discuss the subject and situation of the statue. It will probably be a grouping of women, situated in the city centre. This is still a 'work in progress', and I hope to report when it is completed so that WES can join in the celebration.



THE UKRC HAS LAUNCHED its latest women of outstanding achievement portraits. These include WES patron Ann Dowling, WES member Kate Bellingham and Dervilla Mitchell, speaker at a recent WES conference.

**Professor Dame Ann Dowling** (winner of the Inspiration and Leadership in Academia and Research Award). Professor Dowling is head of the UK's biggest engineering department, at the University of Cambridge. She has excelled in the field of aeronautics, a branch of engineering where female representation is

## Honouring outstanding women in STEM

particularly low, making her a vital role model. She is a leading authority on aircraft noise and emissions reduction.

**Kate Bellingham** (winner of the Communicating Science, Engineering and Technology to Society Award). Aside from her career in broadcasting, Kate is a maths teacher and president of Young Engineers and has just completed two years as national STEM careers coordinator. Other projects include being on the government Science for Careers Expert Group, a speaker at Maths Inspiration events, and education ambassador for the BLOODHOUND Engineering Adventure.



**Dervilla Mitchell** (winner of the Inspiration and Leadership in Business and Industry Award) Dervilla is Arup's most senior female engineer and has led the company's involvement in the construction of the fifth terminal at Heathrow. She

helped establish Arup's women's network, ConnectWomen and is championing its Inclusive Leadership Programme.

Others honoured were:  
**Professor Dame Athene Donald** (winner of the Lifetime Achievement Award) Professor Donald is a pioneer of soft matter and biological physics at the University of Cambridge.



● Kate (above); Dervilla (left); Ann (far left)

**Professor Eileen Ingham** (winner of the Innovation and Entrepreneurship in Academia and Research Award) Professor Ingham heads the Institute of Medical and Biological Engineering Leeds University.

**Eur Ing Dr Phebe Mann** (winner of the Tomorrow's Leader Award) is the first woman to hold five professional engineering qualifications in the UK.

**Cary Marsh** (winner of the Innovation & Entrepreneurship in Business and Industry Award) is the CEO and founder of Mydeo.com.

# WES ANNUAL CONFERENCE

## Getting There

**Connecting technical women in road and rail research, design and implementation**

**Friday 7 October**

**The IET, Savoy Place, Londo**

This year's theme is road and rail transportation. The event will provide a forum to showcase policy drivers, technological development, sustainability and engineering innovations in all aspects of road and rail transportation. The event will feature submitted and invited papers and career development in leadership.

By taking part in 'Getting there' you will be connecting with other technical professionals working in road and rail. Whether you are senior or junior you will have the chance to meet with and inspire others as well as raising awareness of the current topical issues and policy drivers, sharing good practice and showcasing women at their best. Possible topics may include:

- ◆ Innovation
- ◆ Health and safety
- ◆ Disaster planning
- ◆ Transport futures
- ◆ Sustainability
- ◆ Energy conservation
- ◆ Fuel economy
- ◆ Construction – road, rail, interchanges
- ◆ Traffic management
- ◆ Leadership



**For more details see leaflet enclosed with this issue or visit the website [www.wes.org.uk](http://www.wes.org.uk). Please register on-line.**

## New equality legislation

### Public sector equality

The new public sector equality duty came into force on 5 April 2011. The new requirements on public authorities make a distinction between those that are only covered by the general equality duty and listed bodies,

Previous duties covered race, disability and gender, with some aspects covering gender reassignment. The new equality duty covers race, sex, disability, age, gender reassignment, religion or belief, sexual orientation, and pregnancy and maternity. It also covers marriage and civil partnership with regard to eliminating discrimination.

**Equality information** – Although there is no express requirement in the general equality duty to collect and use equality information across all protected groups, it will be difficult for a public authority to show that it has satisfied the aims in the general equality duty without doing so.

Authorities covered by specific duties must publish information to demonstrate compliance with the general equality duty by 31 July (31 December for schools), and at least annually after that. The information published must include: the effect that policies and practices have had on employees and people from the protected groups; evidence of the analysis undertaken to establish whether policies and practices will (or have) furthered the three equality aims in the general equality duty; details of the information used in that analysis and the engagement undertaken.

Although the general equality duty does not specify how you should analyse the effect of your policies and practices on equality, doing so is an important part of complying with the duty.

The general equality duty does not require bodies only covered by the general equality duty to set equality objectives. Listed bodies must publish objectives by 6 April 2012 and at least every four years after that.

The procurement and commissioning duty applies to all public authorities, and to all contracts.

### Default retirement age

The Default Retirement Age (DRA) is being phased out between 6 April and 1 October 2011. The change gives people the freedom to continue working for longer.

The last day employees can be compulsorily retired using the DRA will be 30 September. This means that the last day to provide the six months' notice required under the DRA was 30 March.

From 1 October, employers will not be able to use the DRA to compulsorily retire employees.

There will still be exceptions to these new rules, however. Employers may continue to have a compulsory retirement age, but must be able to prove it is justified if challenged at an Employment Tribunal.

If your employer is retiring you using the Default Retirement Age then both the following must apply:

- ◆ you must have been given notice of your retirement date before 6 April 2011

- ◆ you must be aged 65 or over (or your employer's retirement age, if that is higher) by 30 September 2011.

If you have been given this notice you have the right to request to work past your retirement date.

Your employer must consider this request. You must make this request more than three months before your retirement date. It must be in writing and must state whether you want to continue to work: for a set period of time, indefinitely or until a stated date.

You may want to think about flexible working options.

If you decide to work longer, you're likely to take home more money because you don't pay national insurance over state pension age; you are likely to pay less income tax when you're over 65; you will be entitled to your state pension.

More information available: [www.direct.gov.uk/en/Pensionsandretirementplanning](http://www.direct.gov.uk/en/Pensionsandretirementplanning)



### Emma's success in aviation engineering

EMMA REID is one of the few women working in aviation engineering in Ayrshire.

She was chosen to join GE Caledonian in Prestwick, which repairs and overhauls jet engines, as a modern apprentice in 2006 and has gone on to succeed at the highest level.

Emma spent the first year of her modern apprenticeship at Kilmarnock College on a full-time basis. During this time she gained practical experience.

Over the remaining three years of her apprenticeship Emma worked in various areas of GE Caledonian whilst also attending day release. By the end of her apprenticeship she had gained both an HNC qualification, achieving one of the highest marks in Scotland (92%),

and an HND qualification. She won the college's HNC shield for being a high achieving student. Over the past four years, she has become a respected member of the engine build department at GE Caledonian.

Stewart Christie, HR manager said: "GE prides itself in its commitment to equal opportunities. In a sector within Ayrshire that is traditionally seen as a predominantly male environment, Emma has consistently out-performed the other apprentices within her class at college. To gain the level of expertise achieved by Emma in a relatively short time would be admirable in any industry, but to achieve it in the highly regulated environment that is aviation is outstanding."

### Age discrimination

The Equality Act 2010 includes provisions enabling a ban on age discrimination in the provision of services and public functions. Implementing this ban requires secondary legislation, setting out the circumstances in which it would be lawful to use age as a reason for treating people differently.

A consultation process has just concluded to consider this secondary legislation. This sets out exceptions prepared for the following areas:

- ◆ Age-based concessions. This would allow concessions or benefits to be age-limited.

- ◆ Group holidays. This will allow specialist holiday providers to provide holidays for people in particular age groups.

- ◆ Immigration. When determining eligibility to enter and re-

main in the UK, age needs to be one factor that is given consideration in some applications.

- ◆ Sport. This will allow for the continuation of age-restricted sports competitions, such as, under-21s' football competitions and tennis veterans' matches.

- ◆ Residential park homes. This will allow residential park homes to continue to include age limits in their admission rules.

- ◆ Financial services. This will allow the use of age in the assessment of risk, in the financial services sector to continue, provided that this is based on reliable and relevant information.

The government proposes no specific exceptions to the ban on age discrimination for health or social care services. This means that any age-based practices by the NHS and social care would need to be justified, if challenged.

# news

■ Keep us informed of the latest news in your area – email [editor@wes.org.uk](mailto:editor@wes.org.uk)

LAUNCHED IN 1901, **Holland One**, the first operational Royal Navy submarine, has received a prestigious Engineering Heritage Award from the Institution of Mechanical Engineers in May. The award, which celebrates Britain's greatest engineering feats, recognises Holland One's pivotal role in changing naval warfare and also pays tribute to the tremendous restoration job that has saved this crucial part of British heritage for future generations.

Holland One was commissioned despite the Royal Navy's traditional mistrust of submarine warfare. Admiral Sir Arthur Wilson, then Controller of the Navy, described it as "underhand, unfair and damned un-English". Nevertheless in 1900 the Royal Navy secretly placed an order with submarine pioneer John Philip Holland.



Holland's great technological innovation was marrying the internal combustion engine with the electric motor and electric battery, all in one hydrodynamic machine. This would set the standard for submarines across the world for decades to come.

After Holland One's secret launch in 1901, it had 12 years of experimental service before being decommissioned in 1913. Whilst being towed to the scrap yard it hit stormy weather and sank. It remained at the bottom of the Channel until the Royal Navy Submarine Museum found and salvaged the wreck in 1981.

Holland One is now on permanent public display at the Royal Navy Submarine Museum, Gosport.

A LANCASTER PhD student is celebrating winning a major early career award. Former journalist **Cherry Canovan**, at the age of 39, decided to study science after writing stories detailing the lack of women in physics, was named the Very Early Career Woman Physicist of the Year at a ceremony in London organised by the Institute of Physics and sponsored by Shell. The £1000 award was presented by Professor of Particle Physics, Amanda Cooper-Sarker of Oxford University.



The award celebrates the work of female physicists who have completed their first physics degree in the last five years. Successful candidates must show that they have made a substantial academic contribution as well as supporting and encouraging others in the field.

The award was for her published work on problems in classical electrodynamics, as well as her interest in helping other women get involved in physics. She founded the department's Women in Physics group two years ago, since then it has held many meetings and encouraged women from all career stages and research groups to get to know one another.

Cherry said: "I am delighted and honoured to have been awarded this prize, which I hope will encourage other women – maybe even young mums like me – to believe that they can have a successful career in physics."

She said: "I started to study physics with some trepidation, but I need not have been worried:

the advice and support given to me by the department was of the first order. This experience has encouraged me to try to offer others the help and support that was so generously given to me."

THE TUC HAS published a report providing guidance on how employers and unions can work together to support women through the menopause at work. Three and a half million women over the age of 50 are currently in work. The TUC believes that employers need to recognise that women of menopausal age may need extra consideration, as the menopause can affect how a woman does her work, and her relationship with her boss and colleagues.

'Supporting Women Through the Menopause,' suggests:

- ◆ Employers should ensure that all line managers have been trained to know how the menopause can affect work and what adjustments may be necessary.
- ◆ Employers can highlight the menopause so all staff know that the workplace has a positive attitude to the issue.

- ◆ Women should be given information on how they can get support for issues that arise as a result of the menopause.

- ◆ Sickness absence procedures should cater for related sickness absence.

- ◆ Working time arrangements should be flexible enough to ensure they meet the needs of menopausal women, who may need to leave work suddenly. They may also need more breaks during the day.

- ◆ Risk assessments should consider the specific needs of menopausal women and ensure that the working environment will not make their symptoms worse. Issues, such as temperature and ventilation, need investigation.

The guidance is available at [www.tuc.org.uk/extras/Supporting\\_Women\\_Through\\_the\\_Menopause.pdf](http://www.tuc.org.uk/extras/Supporting_Women_Through_the_Menopause.pdf)

## Unlocking insulin's structure

The 2011 Dorothy Hodgkin Lecture was given in Oxford in March by **Professor Eleanor Dodson** FRS on the topic of mathematics in crystallography. She is an Emeritus Professor at the University of York.

She had worked alongside Dorothy from her arrival in the UK from Melbourne, Australia, so Eleanor was able to pepper her lecture with both personal anecdotes and photographs of her time spent with Dorothy.

Her talk spanned a timescale from the 16th century to the present day. She highlighted the mathematical concepts that form the basis of crystallography including those established when scientists examined the morphology of crystals using a visible light microscope. In this way space groups were defined long before an X-ray was ever incident on a crystal.

Eleanor Dodson was recruited to the Oxford group in the early 1960s to provide a mathematical treatment of the matrices required for the most complex structure solution attempted to date – insulin with its 800 atoms. With Eleanor's input the final insulin maps were beautiful and at a resolution which allowed water molecules to be placed within the structure. Dorothy's ultimate aim to see atoms had been achieved.



CONGRATULATIONS TO **Alison Noble** who has been awarded a Statutory Professorship in Engineering at Oxford University – the first woman to hold this senior level appointment at Oxford. She is a Fellow of St Hilda's College and senior member of the IEEE, an FIET, and a FREng.

## Alison is first female engineering professor at Oxford

Alison gained a first class degree in engineering science from Oxford in 1986, and a DPhil in computer vision from 1989. From 1989-1994 she was a research scientist at the GE Corporate Research & Development Center, Schenectady, NY, USA (now its Global Research Center), where she was based in an NDE group and successfully led the transition of three inspection systems to GE manufacturing departments.

She returned to Oxford in 1994 as a university lecturer, to help set-up a new biomedical image analysis laboratory. She has played an instrumental role in introducing biomedical engineer-

ing into the graduate and undergraduate curriculum at Oxford, including being the first director of its MSc in Biomedical Engineering.

She is a director of the Biomedical Image Analysis Laboratory, which is based in the Oxford Institute for Biomedical Engineering, part of the Department of Engineering Science, which opened in January 2008.

Alison leads research activities in cardiovascular image analysis, women's health imaging (obstetrics and perinatal), oncology and smaller activities in image-guided interventions and therapy and cellular image analysis.

## Stephanie becomes an FIMechE

**Stephanie Merry** has achieved the status of Fellow of the Institution of Mechanical Engineers.

Dr Stephanie Merry is director of Focus Offshore Ltd, a technical consultancy specialising in marine renewable energy, and is sector advisor in marine renewables for the Renewable Energy Association in London. Prior to setting up her own company, she worked as principle engineer in the Submarine Hydrodynamics Group at the Defence and Evaluation Research Agency (DERA), Haslar. From 1990 to 1996 Stephanie was a lecturer in marine technology at the University of Southampton. Her job included integrating students and staff from the Engi-

neering Faculty into the world-renowned National Oceanographic Centre).



## Yini students sought

EDUCATION CHARITY EDT wishes to contact people who have taken part in its 'The Year in Industry' programme over the past 25 years.

The Year in Industry is celebrating its 25th anniversary this year and EDT wishes to contact as many as possible of the 12,000 former students that have been through the programme during that time.

Chris Ward, national director for the programme said: "We want to have as many alumni as possible to share in our celebrations across the country, we want to find out what they are doing now and to keep in touch with them in future through a new alumni programme."

There will be regional celebrations throughout the country with a national celebration in London in September.

The Year in Industry is typically taken by students between school and university and consists of a paid internship with leading science and engineering companies.

Alumni should contact EDT on 01707 871 520 or email [yini25@etrust.org.uk](mailto:yini25@etrust.org.uk). More information can be found at [www.yini.org.uk](http://www.yini.org.uk).

## Diary 2011

● **19-22 JULY ICWES 15:** Leadership, Innovation and Sustainability in Adelaide, Australia. There will be development training courses by Engineering Education Australia on

■ Please send all diary items by the next issue deadline: 15 Sept 2011.

Facebook on 19 July. For more details see [www.icwes15.org](http://www.icwes15.org).

● **15 SEPT Networking Women** at the Oxford Centre, 333 Banbury Road, Oxford OX2 7PL. Further details from: [www.networkingwomen.org.uk/events/conferences](http://www.networkingwomen.org.uk/events/conferences)

● **7 OCT WES Conference & AGM** (see p 8)

● **8-9 NOV European Gender Summit** in Brussels will address new perspectives in gender research and innovation, and gender equality issues in science. Further details from [www.gender-summit.eu](http://www.gender-summit.eu).

■ Keep us informed of the latest news in your area – email: [editor@wes.org.uk](mailto:editor@wes.org.uk) or write to: the Women's Engineering Society, c/o IET, Michael Faraday House, Six Hills Way, Stevenage SG1 2AY

# green news

12 Latest developments in green technologies

A COLLABORATIVE PROJECT, bringing together three of Europe's leading utilities and wave energy technologies (provided by Aquamarine Power and Pelamis), has been selected by the government for a major European funding bid.

The Pentland Orkney Wave Energy Resource Ltd project is the only wave energy bid being put forward by the UK government to the European Investment Bank for consideration in the first round of the EU's New Entrant Reserve scheme – a fund worth around EUR 4.5 billion to support carbon capture and storage and innovative renewable projects across the European Union.



The project aims to deliver the world's first large-scale, grid-connected demonstration of a wave energy farm with a total generation capacity of 28 MW.

If successful, the project will comprise ten near shore Aquamarine Power Oyster 3 devices and 24 offshore Pelamis machines within the Pentland Firth and Orkney Waters leasing area, operating in multi-device array configurations. Both of these technologies are leaders in their field, having been successfully demonstrated at small scale. The project will have a single point of connection to the onshore grid.

THE INNOVATIVE TEAM behind the award winning Wind-Up Radio, using new micro turbine technology, has launched the world's first water-powered radio.

The H<sub>2</sub>O(tm) Shower Powered Radio provides users with a convenient, and energy efficient, means of listening to their favourite radio stations whilst in the shower. Using a patented micro turbine concept, the FM radio is powered solely through the motion of water flowing through a small H<sub>2</sub>O(tm) micro turbine; driving a generator that creates energy

to power the radio. The radio dispels the need for disposable batteries, as the integral battery recharges as the shower runs.

Turning on automatically when the shower is used, the H<sub>2</sub>O(tm) shower powered radio memorises the last chosen radio station and speaker volume. The radio even allows users to carry on listening after the shower is turned off, using any excess energy stored in an integral Ni-Mh rechargeable cell. Installing the H<sub>2</sub>O(tm) radio is simple, with no need for tools. The small, slim design slots directly on to the faucet of the shower; placing the radio in a position to use the steady flow of water on

its way to the shower head, without impinging or getting in the way of the shower user.

Vivian Black, managing director of the Tango Group, owners of H<sub>2</sub>O(tm), said, "With the clear sound, and excellent reception that the radio enjoys; we hope to encourage singing in the shower all around the UK."

<http://www.tangogroup.net>



IN MARCH THIS YEAR the Scottish government approved Scottish Power Renewables' plans to develop a 10MW tidal power array in the Sound of Islay on Scotland's west coast. The first project of its kind in the world, envisages generating enough renewable electricity to power the equivalent of the whole of Islay.

ScottishPower Renewables (SPR) plans to install ten tidal turbines, each capable of producing 1MW of electricity. The project will use



HS1000 tidal turbines (shown above) developed by Hammerfest Strøm AS, and is seen as one of the world's most advanced tidal turbine designs.

Keith Anderson, chief executive of ScottishPower Renewables, said: "Tidal power has long been considered as one of Scotland's most valuable renewable energy resources and we have discussed its potential for many years. This approval moves the whole marine renewables industry forward in Scotland and the UK. It is a first in terms of approval for a tidal project in Scotland, and also a world first for an array of tidal power machines. The understanding we develop from Islay will be essential in delivering the larger planned projects in the Pentland Firth."

Cabinet Secretary for Finance and Sustainable Growth John Swinney said:

"ScottishPower Renewables array will work in harmony with the environment and use the power of the tides in the Sound of Islay to generate enough green energy to power double the number of homes on Islay. There is simply nothing like it consented anywhere else in the world."

MARINE CURRENT TURBINES Ltd (MCT), in partnership with RWE npower renewables, has submitted a consent application to install a 10MW array of tidal stream turbines off the North West coast of Anglesey in 2015. The array of seven twin rotor turbines will harness the power of the tidal waters, generating enough power for over 10,000 homes. It will be the first tidal array to be deployed in Wales.

This tidal farm, using the fast moving and predictable flow of the tides, will use MCT's proven and award-winning tidal energy technology (known as SeaGen) to generate enough power to supply electricity for up to 10,000 homes. The project will use, where possible, local businesses for the assembly, installation, operation and maintenance of the tidal array.