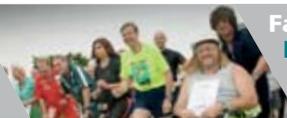




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ISSUE 6/WINTER 09



the newspaper for AWE's neighbours

# connect



Top presenters... with the Rubens tube are, left to right, Adele Donovan, Louise Waterhouse, Scott Aitken, Edd Arran and Fraser Dear

## Demo five light up physics show

**An explosive performance** by an AWE team at Cambridge University's Physics at Work exhibition was so successful at igniting teenagers' interest they voted it the event's top presentation.

Dr Fraser Dear and four colleagues wowed the 14 to 16-year-olds with their demonstration of sound and pressure waves with two experiments, one using exploding flour and the other making flame waveforms with a 1.5-metre gas burner called a Rubens tube.

*Mock the Week* presenter Dara Ó Briain handed the AWE team its Presenter of the Year award at the three-day showcase aimed at encouraging 2,500 children to get involved in physics.

"It was our first time at the event and we decided to pull out all the stops to challenge last year's winners Rolls-Royce for the trophy," said Fraser, who worked with Scott Aitken, Edd Arran, Dr Adele Donovan and Louise Waterhouse.

"We chose experiments the kids wouldn't have seen – or, at least, not on this scale – and did 12

sessions each day with about 20 children at each of them. We did a version of the custard powder experiment using chickpea flour in a large Perspex box with a gas burner inside. After the whole thing blew up, we played back the blast with high speed images.

"With the Rubens tube, which looks like a long gas barbecue attached to a speaker, we played Black Eyed Peas and Dizzee Rascal clips into it to show how sound waves affect the gas pressure and the shapes of the flames.

"There were lots of 'oohs' and 'ahs'. It was very rewarding. The kids came in looking uninterested but were very quickly glued to every word with the experiments we delivered," said Fraser, who was interviewed by ITV Anglia during September's exhibition at the Cavendish Laboratory.

Lindsey Appleton, from AWE's Schools Liaison Scheme, said: "It's a real testimony to their captivating demonstrations that the AWE team was voted number one."

### Roundabout completes roadworks

The last phase of roadworks around AWE has finished – with the last roundabout opening in September.

The A340 gate – opposite Youngs Industrial Estate – has re-opened now the new roundabout there is complete. This will help AWE absorb traffic that traditionally uses the west end of site.

Dave Murray, head of travel and transport strategy, said: "We are delighted that the final external road improvements are now complete.

"We are very happy with the project and the good working relationships developed with local

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## Roadworks complete

• from page 1

councils, the police and residents.”

The guests at the opening included representatives from West Berkshire Council and Youngs Industrial Estate, as well as other companies that provided support to the project.

As a result of the gate re-opening, the Falcon gate near the main entrance to AWE is now dedicated to pedestrians and cyclists – showing AWE's commitment to alternative ways to travel to work. With the completed crossing improvements to the Falcon Gyrotary and pavement upgrades to Winkworth Lane, walking and cycling to AWE is much more enjoyable and is now even safer.



Open for business... Dave Murray, second right, joins guests in the opening of the new roundabout

## Rocket stars take off for space centre

**Budding physicists** from local schools launched their talents when they took part in AWE's Water Rocket Challenge.

The competition – aimed at 14 and 15-year-olds from schools on AWE's Schools Liaison Scheme – tested the theories pupils learn in the classroom and was held in the grounds of Mary Hare School in Newbury.

Their task was to build a rocket out of nothing more than a plastic fizzy-drinks bottle.

AWE staff gave practical advice to get students on their way. The rockets were propelled using a combination of water and air pressure and the judges appraised entries on distance, time in the air and overall design.

The winning school was Brighton Hill Community College, Basingstoke, which won a trip to the National Space Centre in Leicester.

Lindsey Appleton from the Schools Liaison Scheme said: “The challenge was really enjoyable and all the teams seem eager to enter again next year.”

“Students were able to use their knowledge of physics in a creative and practical way. Thanks to staff at Mary Hare for their support and also to AWE's technical outreach department.”

Other schools that took part were Kennet School, Thatcham; St Bartholomew's School, Newbury; Mary Hare School, Newbury and Denefield School, Reading.



Safety-conscious... members of the site control team

# Super-safe... that's the site controllers

**The 400-strong** AWE site control team has notched up 1.3 million hours without a lost time accident (LTA).

“This remarkable achievement – stretching back to January 2008 – is a very good example of the company's One Team effort,” said Steve Bucksey, until recently site control's assurance team leader. “It's a testimony to the culture of assurance management embedded into his management team by Darren Bisset, head of site control.”

Steve, who is now based at Burghfield as an environmental

safety and health manager for the assembly facility, said that site operations is one of the key operating areas at AWE.

“But perhaps not everyone appreciates its role in workplace health and safety,” he said.

The group comprises AWE's fire, rescue and ambulance services, site response group, safety shift, site control operations team, Mitie civilian security team, DI health physics and head of radiation protection function.

“This achievement really shows how everyone in site

control has bought into creating a safer working environment for themselves and their colleagues,” said Steve.

Darren Bisset added: “Achieving 1.3 million hours since the last LTA represents a significant milestone – it's a testimony to the endeavours of the managers and supervisors within site control, the support we've had from our Infrastructure assurance colleagues and, in particular, all of the site control team members who support the sites activities on a 24/7 basis.”

# Pupils face a double test

**School pupils** from across the region have been putting their science and engineering skills to the test at two annual AWE events.

The Chain Reaction Challenge and the Schools Engineering Challenge – which both took place at Tadley Community Centre – form part of the AWEsome Science campaign which encourages interest in science and engineering at a young age.

Children from seven local schools took on the Chain Reaction Challenge, organised by AWE graduates for final year primary school pupils. Each team designed and built a chain reaction machine from ordinary materials

found in the home or classroom. The contraptions had to include a series of actions – such as balls rolling, pendulums swinging and dominoes toppling – with each movement transferring energy to the next.

Dario Castiglione, graduate project leader, said: “This event was designed to promote science and engineering in a fun and accessible way to Year 6 pupils. We've had great feedback from the teachers and students.”

First place was awarded to St Joseph's Primary, Aldershot, which received £300 to spend on school equipment.

Meanwhile, 10 local schools competed in

the Schools Engineering Challenge.

Over 50 Year 10 pupils, aged between 14 and 15, took part and had to design, build and test a catapult using ordinary materials supplied to them on the morning of the event.

The challenge demonstrated the importance of teamwork, material selection and planning – all vital aspects of a career in engineering or science. The finished catapults were assessed according to their performance in several tests.

First prize was awarded to Robert Mays School, Odiham, which received £1,000 to spend on scientific or technical equipment.

## Science teams wow judges

**Teams from** local schools wowed the judges at this year's AWE A-Level Science Challenge.

The annual event, run by AWE graduates, forms part of the company's AWEsome Science campaign.

The challenge is intended to complement schools' curricula and encourage students in their study of science, through a series of challenges and puzzles.

Each of the nine schools that took part at the Tadley Community Centre had a team of six students. There were also two teams of teachers and AWE staff.

The tests were four mini challenges in the morning covering aspects of physics, biology and chemistry, where the students answered question sheets and performed some experiments.

Following this, pupils proved their skill in detecting acid, light and heat by using sensors in three different scenarios.

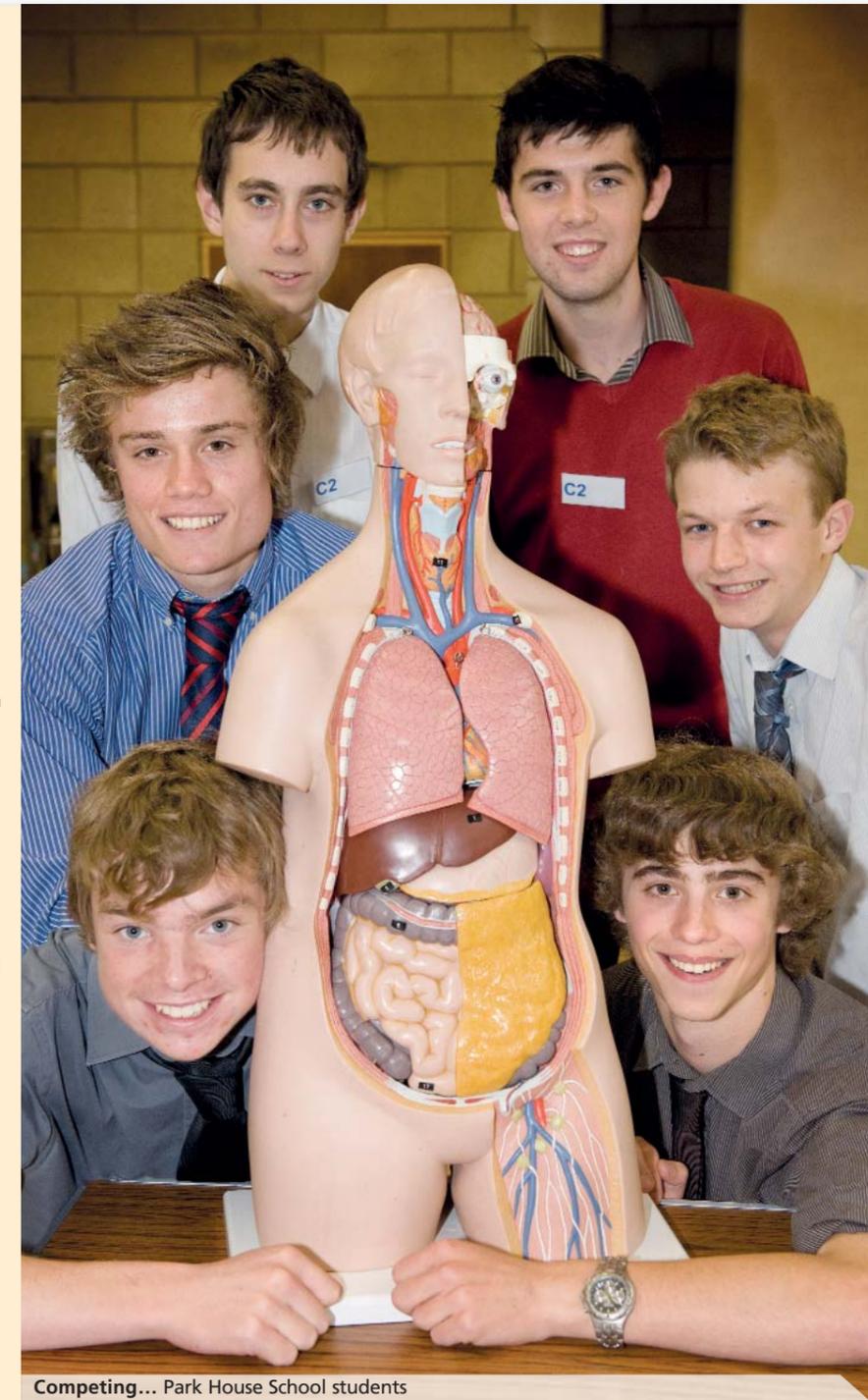
Matthew Cunliffe from the AWE graduate team said: “The aim of the challenge was to give students a fun and rewarding day, covering all areas of science to demonstrate how these concepts can be applied to real-world situations.”

“Along with the fun of remote-controlled cars, the students had to demonstrate their theoretical knowledge of the science they were covering. Showing how science can be advanced from a classroom setting gives the students real impetus to continue to push on into higher education.”

“The graduate project team would like to thank the students and teachers for helping us provide a very successful and educational day.”

The schools that took part were: Theale Green Secondary School, Reading; Abbey School, Reading; Denefield School, Tilehurst; Highdown School, Reading; Kennet School, Thatcham; Park House School, Newbury; St Gabriel's School, Newbury; St Bartholomew's School, Newbury; and Kendrick School, Reading.

The winning school was St Gabriel's, which was awarded £500.



Competing... Park House School students

# Models support Kew seed project

**AWE scientists** have harnessed advanced technology to help out colleagues at the Royal Botanic Gardens, Kew.

The Aldermaston team used 3D X-ray microtomography and rapid prototyping to create giant, but highly accurate, models of tiny seeds for Kew's Millennium Seed Bank Project (MSBP).

Working with partner projects across the globe, the MSBP is developing seed banks which provide an insurance policy against the extinction of plants in the wild. By the end of the decade, it will have stored seeds from 10 per cent of the world's wild plant species.

Up to 127 times normal size, the models produced by AWE will be used in the MSBP's Banking on Seeds exhibition.

The seed modelling collaboration came about as the result of a meeting between AWE senior scientist Paul Morrell and Professor Pritchard, head of research at Kew Gardens.

"There is a close correlation in the techniques the MSBP is interested in for the seeds and AWE's interest in polymer characterisation," said Paul.

"This has been a fascinating exercise that has led to a useful collaboration between AWE's polymer characterisation and development, reverse engineering and the rapid prototyping teams.

"The process of transforming 3D X-ray image data into a solid model has not been easy, but the beauty of projects like this is the interactions that they generate."

Apart from the models, the collaboration will provide further benefits.

AWE's expertise in 3D X-ray microtomography will provide the MSBP with images and information on the structure of seeds of commercial and endangered interest. The MSBP is also interested in a proof of concept study to show how the technology can be used to study the internal structure of seeds.



Giants... AWE scientist Paul Morrell with two seed models

## Accelerator shows off its facilities

An AWE facility that's been undertaking important work for the past 45 years has thrown its doors open to AWE visitors for the first time.

The ASP accelerator (not an acronym, but named to reflect the link with its sister facility the VIPER reactor) was installed in 1964, as a joint venture between AWRE and the High Voltage Engineering Corporation in the USA.

Shaun Hughes, senior accelerator supervisor, organised the open days to raise awareness of a capability that many AWE staff may not realise is sitting on their doorstep.

"We wanted to send the message to AWE colleagues that we're a facility that's here to help. Our capabilities might be able to assist others within the company, but they don't know it," said Shaun, who has been at AWE for 39 years.

ASP is mainly used as a source of high energy neutrons (14MeV) for a variety of purposes, including the calibration of neutron detectors and studies into the vulnerability and hardness of electronic components or systems. ASP also has the capability for 3MeV neutron production. Operation in either energy range can be in steady state or pulsed mode.

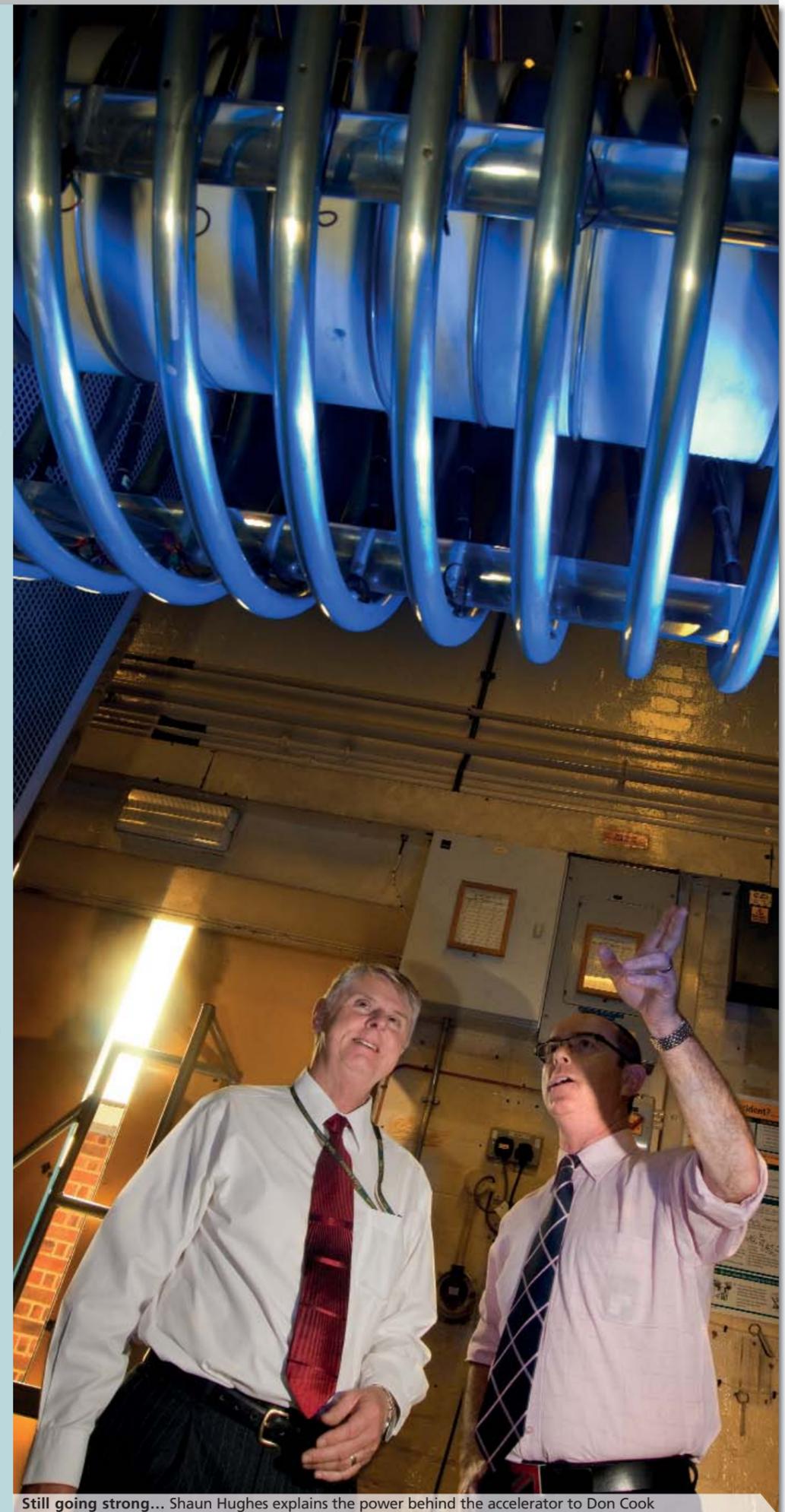
"ASP performs a vital function as the UK 14MeV neutron primary standard, and serves to calibrate targets used for important research, engineering and development," said AWE's former special advisor Don Cook, who opened the event.

The open days kept facility staff busy, with groups being given tours of the ASP accelerator every hour for two days. Each session involved a tour of the ASP control room, the accelerator itself and the target cell.

"270,000 volts of power go through this machine," Shaun told AWE onlookers during their tour of the accelerator.

"Basically, ASP is a machine which produces an ion beam or, more precisely, a beam consisting of deuterons (deuterium gas which has been ionised). It's the deuterons that we want to accelerate on to the target, and cause a fusion reaction which gives us the 14MeV neutrons.

"Safety procedures are, of course, priority when you are dealing with such high voltage," said Shaun. "We have tried and tested procedures in place to ensure safe practice at all times."



Still going strong... Shaun Hughes explains the power behind the accelerator to Don Cook



Taking a break... Dave Stephenson visits a penguin colony

# Ice work if you can get it!

**Electrical engineer** Dave Stephenson experienced the trip of a lifetime when he spent 15 months working in the frozen wilderness of Antarctica.

Dave was part of a small team based at the British Antarctic Survey's Halley Research Station on the Brunt ice shelf – one of the world's leading environmental research centres – several hours from the nearest civilisation.

Dave, who had been at AWE for two years before he joined the Antarctic Survey, has now returned to his team in DSE and is adjusting to life back in the UK.

"The experience was truly a trip of a lifetime and it's changed me as a person in many ways – although now I'm back into my role at AWE it sometimes feels like I've never been away!" said Dave.

Dave first applied for a job as an electronic engineer at the Antarctic Survey station when he left university, but missed out on the post. "Since then it's been my dream to work in the Antarctic. It seemed like fate when I saw the

same position advertised some years later – and I count myself lucky I got to realise my dream," he said.

After three months of training in the UK, Dave spent 15 months in Antarctica. His role was to keep the station and the scientific experiments running, even when the scientists had gone home for the winter.

In temperatures as low as minus 50°C in the winter and around minus 10 in summer, Dave's routine tasks included monitoring electrical scientific equipment and undertaking meteorological work such as launching daily weather balloons and taking ozone readings.

Non-routine work included trips deep into Antarctica to service science equipment. Dave said: "It was so remote we had to fly there. With so few of us on the station we all had to multi-task and so I would act as the co-pilot.

"In the summer months, the staff numbers at the station could reach up to 70, but in the nine months of winter there were just 11 of us.

"With up to three months of 24-hour darkness in the Antarctic winter, and no TV or radio, we had to be inventive in creating our own entertainment," said Dave.

"In the summer the mood lifted and we'd go on exciting expeditions – such as visiting the Emperor penguin colonies where tens of thousands of penguins gathered. It really was magical."

Dave says the accommodation was built on steel legs and is jacked up annually to keep it above snow level and, although his room was basic, it was warm.

"All our supplies were delivered just once a year, by ship," said Dave. "It meant we only had fresh food for a short time. We mostly lived off frozen and tinned food.

"It was a tough job. But there were times, such as lying on my back in the snow marvelling at the Aurora Australis, that I'd reflect on how lucky I was."

Dave is also a member of Boundary Players, a theatre group made up of many AWE staff. "One of the first things I did when I came back to the UK was appear in *Going Postal*," said Dave. "They'd sent the script to me via the Falkland Islands so I could learn my lines on the long journey home!"

## Fact File

- The British Antarctic Survey is responsible for the UK's national scientific activities in Antarctica
- Data from the Halley Research Station led to the discovery of the hole in the ozone layer
- The Halley Research Station was first occupied in 1956.



Light fantastic... the Aurora Australis provided one of the highlights of the trip



Inspection... Colin Low checks the plating baths

## Refurbished shop offers wide range

**You may** think that an old pump and a hi-tech warhead component don't have much in common – but they are just some of the items that pass through AWE's surface finishing facility.

Formerly known as the plating shop, the refurbished facility looks fairly innocuous from the outside – but deep within the building sit rows of bubbling vats of acid and cyanide which are key to the electroplating process.

Put simply, electroplating coats a base material with a thin layer of metal by sitting it in a solution – either acid or alkaline depending on what the base material is – through which an electric current flows.

Despite the nature of some of the chemicals used in the facility, the safety record is second to none and there are excellent safety procedures in place.

A diverse number of components are sent to the facility to be cleaned, plated in host metals ranging from copper, zinc, nickel and tin to chrome, lead, silver and gold, and sometimes polished or painted.

"The nature of the metallic plating depends on what the component will be used for," said one of the workers in the facility. "Copper is often used as a primer or base, silver is good for electrical components, gold is an effective shield, while zinc protects against corrosion."

The new name of the facility reflects the wide range of services on offer, in addition to electroplating.

The facility provides everything from shot blasting, solvent degreasing, chemical cleaning, de-rusting and de-scaling through to electroplating, anodising, painting and powder coating.

Shot blasting – where tiny chips of iron are blasted out of a hose-gun at high pressure, taking off chipped paint or rust – is often the very start of the process when components come to the facility. It's blasted, then dipped in acid to clean it, and then either painted or plated.

The main message from the team at the facility is that they are here to help and, whatever the problem, they will do their best to find a solution.

## Fancy that... it's a fun run

**You'd be forgiven** for rubbing your eyes in disbelief if you caught sight of *Little Britain's* Lou and Andy and a giant green caterpillar at AWE.

In fact, they were just some of the fancy dress runners taking part in two company charity events.

The Burghfield FunWun (which offered the choice of a run or a walk) raised over £600 for AWE's charities of the year,

while the annual Aldermaston Fun Run, organised by graduates, raised over £1,600 for Bliss and the Basingstoke Advocacy Scheme.

"It was fantastic to see the effort everyone made and the great range of costumes – not to mention the amount we've raised for such good causes," said business graduate Mark Hall, who helped organise the Aldermaston Fun Run.



Star line-up... Lou and Andy at the start of the Burghfield FunWun

## Paris ride of thanks

**Cycling from** London to Paris is not for the faint-hearted, but one AWE employee has completed it after a life-saving double transplant operation.

Richard Faint received a new kidney and pancreas in 2007. To give something back, he completed the 300-mile ride, raising £2,200 for charity Live Life Then Give Life, which aims to save and improve the lives of all those in need or receipt of organ and tissue transplants.

The ride was split over four days. "The first day of 95 miles was the hardest," said Richard. "It got easier as the days went on in terms of distance and terrain.

"I wasn't too well in the weeks leading up to it and I tended to be nearer the back, but I am glad I did it. I owe it all to my simultaneous kidney and pancreas transplant and the guy who died and helped me live.

"Life really did begin at 40 for me," said Richard. "I'd been an insulin-dependant diabetic since 1979 and developed complications, suffering total renal failure four years ago.

"Following emergency surgery and dialysis I got the chance to be considered for a simultaneous kidney and pancreas transplant. After months of tests, I was deemed a suitable candidate and placed

on the waiting list," he said.

"After a couple of false alarms I got the call that saved my life, due to the selfless act of a young man who decided to register as an organ donor."

Unfortunately, there aren't enough donors in the UK – last year 1,000 people died waiting for their chance. While 90 per cent of people support the concept of donation, only 26 per cent are on the Organ Donor Register.

"I've enjoyed a steady recovery over the last two years and life without diabetes is good. I wanted to say thank you by cycling to Paris to raise much-needed funds," said Richard.



Pedal power... Richard Faint



Dog donor... Martin and Susie Blight with Henry

## Puppies aid hearing charity

**AWE's Martin Blight** is helping Hearing Dogs for Deaf People – a charity which provides a lifeline to severely and profoundly deaf people across the UK – by donating puppies for its training scheme.

Martin, based at Aldermaston, and his wife Susie have been breeding working dogs for seven years – and have donated four puppies to the Hearing Dogs programme.

Martin's latest donation is Henry, a "sprocker" spaniel – a springer/cocker cross. It's hoped five-month-old Henry will become part of Hearing Dogs' own breeding programme, which provides a source of new recruits in addition to rescue centres and breeders.

"Hearing dogs change lives," said Gemma Walton from the charity. "They alert their deaf owners to sounds we take for granted, providing greater

independence, confidence and security."

Martin said: "We just give the puppy. All the hard work is done by the amazing people at Hearing Dogs. But it does give us an enormous sense of satisfaction to know that a puppy we donate will change the lives of others in such a positive way."

Another of Martin's donations, black labrador Jake, has recently been placed with deaf recipient George Street. "Jake is my friend as well as my helper," said George. "Before getting Jake I was quite anxious, but now I can just relax. We've got a very special bond."

● If you would like to volunteer to be a puppy socialiser, or become involved in the breeding scheme, or if you know someone who might benefit from a hearing dog, call Hearing Dogs on 01844 348100 or visit [www.hearingdogs.org.uk](http://www.hearingdogs.org.uk).