

# The Worshipful Company of Engineers

(Incorporated by Royal Charter 2004)

## The Swordsman Newsletter



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Top Left	The Angel of the North
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Centre	Master's Commemorative Plaque in Robert Stevenson Museum
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Bottom Right	Formula Student racing car at the City University Bridge Lecture
Bottom	Junior Warden Tony Roche at the Warden's Lecture

**COMING EVENTS**

25th April	Installation Court, Common Hall and Dinner	Skinner's Hall
26th May	Warden's Lecture and Luncheon	Wax Chandlers' Hall
20th June	Visit to the Black Country Museum	
26th June	Election of Sheriffs	Guildhall
4th July	Awards Dinner	Glaziers' Hall
21st July	Golf Day	Clandon Regis
14-17th Sept	Out of Town Meeting	Cornwall
29th September	Election of Lord Mayor	Guildhall
4th October	Ladies Luncheon	Armourers' Hall
27th October	Annual Banquet	Mansion House

## **EDITORIAL**

Welcome to the Fifteenth Edition of the Swordsman which reports in the last six months the hectic life of the Engineers' Company. Once again many thanks to the many reporters who have responded so generously to my gentle cajoling. There are many hidden literary talents in the Company and I look forward to discovering even more!

Again because of pressure on space I have had to omit the text of the Warden's Lecture on RedR and the Bridge Lecture on the Royal Opera House. Both of these lectures are, however, published in the online Swordsman so please log on to [www.engineerscompany.org.uk](http://www.engineerscompany.org.uk) for more details.

Those of you who read the report on the results of Middle Warden, David Bawtree's questionnaire in the last edition will recall that there were two items on which responses were outstanding. These items, 'The Company has too little influence on engineering matters' and 'The Company should become more outward looking' were considered by the Finance and General Purposes Committee in October 2005. The Committee considered that these were intertwined and were reminded that Dr. Len Weaver had considered these in depth during his Mastership. The Committee confirmed the view held then that the professional bodies including the Engineering and Technology Board were better placed than the Company to provide direct influence on Engineering matters. However, the Company does have considerable influence by providing a forum for debate and networking and offering subjects for lectures and speeches. The Committee also believed that the diversity of membership inherent in the Company meant that it could not be anything other than outward looking especially in relation to the external activities in which the Company and the members participated.

Remember this is your House magazine and if you would like to debate these topics or any other then please do write to me.

*Raymond Cousins*

## **THE CLERK'S CORNER**

Around this time of year when quarterage has just been paid and the events calendar for the coming year published, one of the questions that I am often asked is, "Why do Company events seem to cost a lot?" Firstly, I assure the questioner that it's neither Stephen nor I being profligate in the Engineers' Office and, in any case, our budget for each year is tightly examined by the Finance and General Policy Committee each autumn before being endorsed by The Court. This Company budget assumes that, whilst there are official Company guests for the formal activities that are chargeable to the Budget, the social activity element is generally to be self supporting by charges to the actual Members attending. This charge is then based on a fair proportion of the overheads arising at the event venue (eg - hall hire, band charges, incidentals etc) and then the direct costs of food and drink.

In the City, there is no doubt that the cost of Hall charges have been increasing over the years. For the

larger Company events, such as Common Hall and the Awards Livery Dinner, it is necessary to have a capacity available for upwards of 200 people. The hire charges for halls of this size, even with the appropriate discounts for being a Livery Company, are significant. As guide to the order of magnitude of costs for some halls we have used recently and should not be taken as a definitive statement from me, Clothworkers' Hall (capacity 224 diners) is £3000, Merchant Taylors' (capacity 280) is £2000 and Stationers' (capacity 205) is £1600. You will see from this how I was able to cope without extra charges for 2 coaches after the Carol Service last year when Clothworkers' Hall was not available and we went to Stationers' Hall instead. For the smaller venues we tend to use Wax Chandlers' as our 'own' where they let me fly our flag, display the Royal Charter and give us a most favoured treatment. Wax Chandlers' has a capacity of around 60 for dining and the discounted hire charge is £400.

As far as food and wine charges for meals are concerned, most of the Halls have their own caterers or selected tied caterers. In the case of Wax Chandlers' Hall these are, 'Inn or Out' who do give us a fine standard of cuisine with good service. But, while I can choose from an extensive menu listing with a variety of prices for a meal, I have no choice but to employ them in accordance with the terms of our tenancy agreement. Similar situations apply for the main halls where their rules of hire mean food and drink, or alternatively heavy corkage charges, are in the hands of the hall caterer. So gone are the days of bringing in one's favourite caterer with a product styled and tailored for us plus the chance of a discount for loyalty. Although the present system of needing to accept the hall's catering arrangements does pass the responsibility back to the hall for the meal's quality, service and health and safety considerations, there is generally little opportunity to bring the cost down of a reasonable meal. In general terms for example a meal at the Mansion House with wine costs £62 average and in Wax Chandlers' Hall around £49 using our own wine.

On top of these charges there are others such as the Band for the larger events. Here, even while we do get favourable terms from the Royal Engineers because of our special association with them, the MOD requires full recovery rates to apply together with the cost of transport included. Military bands are under significant operational pressure these days and its likely only a small contingent or ensemble can play for us, but even so the total costs of the RE band are around £1000 a time and the Royal Logistics Corps is similar. Of course the bandsmen need to be fed in the out-mess and together with the mandatory requirements to give a meal to others who support a dinner event at a hall. These could be the hall's Beadle, cloakroom attendants, security etc and all together it can result in around 10 or so (or even, the largest being 24 in Mansion House 2005, which included members of The Lord Mayor's and the Sheriffs' personal staff) or more extra on the overall numbers of attendees. Additionally, there will be incidentals such as microphone hire, flowers (£250), gifts for speakers, etc. to take into account too. Overall, an Installation Court Dinner cost can come in at over £12,000 and a Wax Chandlers' Hall evening about £3000.

For really major activities, such as the out-of-town meeting, the estimate of relevant costs to produce an

inclusive package for attendees is quite a lengthy task with very large elements being hotel room and food charges plus at least one prestigious venue for dinner together with many smaller activities with entrance fees on a per person basis as well as coaches (at around £400 each per day) to get us there. In this instance my costing spreadsheet is quite a substantial matrix and I need to do a sensitivity analysis based on the numbers likely to attend plus or minus a suitable margin. All this planning and data collection begins about 2 years ahead in order to fix a price for a double room in the booking form in the new year that the event occurs in. Recent out-of-town meetings, with VAT included, had total costs that need to be recovered of around £45,000. I am very conscious that a small mistake in the costing of the package or a lower than expected take up can mean the chance of a substantial loss. However, it does seem from the speed at which places are booked for the out-of-town meeting that we seem to have priced it about right for a unique weekend with an eclectic package of activities amongst good friends in convivial surroundings.

I could go on a lot more about the intricacies of budgeting and pricing our activities but I am sure that you get the drift that you are only charged the costs incurred and I am very conscious of the need to give value for money without compromising our standards. This means that some of our events will need to remain relatively costly, although in some instances the Master has been known to pay for many private guests or even provide a subsidy for the Hall and this does help to defray a portion of the fixed overheads. On the other hand, some events like the evening at City University for the Bridge Lecture plus a buffet supper afterwards is at no charge and others such as the Golf Day and ad hoc get-togethers arranged by Members outside the formal Company programme have only the costs of direct individual consumption. Overall, I get my guidance on the mixture, style and target budget of the events in the calendar from the Programme Committee and I know they have used many of the suggestions coming back from the Engineers' Questionnaire that was run last year to balance it appropriately. Furthermore, I am always open to ideas directly on ways to cut our costs, so do not hesitate to let me know. In the meantime Stephen and I will continue to work hard to find the best deals and minimise the outlay to ensure that you remain, on the whole, satisfied customers.

*Graham Skinner*



## **VISIT TO NEWCASTLE AND THE NORTH EAST**

**22 to 25 SEPTEMBER 2005**

*As a result of the re-arrangement of the whole of the Annual Programme of the Company there have been two major Out of Town Meetings in six months. Despite this the excellent visit to the Master's home area was very well supported and greatly enjoyed by all who had the privilege of attending.*

*Arriving on Thursday afternoon in glorious sunshine the Master and Pamela Hawley welcomed us in the comfortable hotel right on the quayside with black, red lined, umbrellas which were hardly needed during the whole weekend and packs of information on the area.*

*Time for a walk down the quay in short-sleeve order during which some of the party were bombed by Kittiwakes who do not know the difference between a cliff and the first bridge. Some of our party even found time to have a few rapid revolutions on the temporary ferris wheel giving excellent views of the whole city.*

*Then to the informal welcome dinner where we were all issued with our official Geordie Passport (wi a veesor) and we had to have our blood group officially registered as Broom.*

*The Clerk then whetted our appetites for a very exciting tour which is vividly described below by the willing 'volunteer' reporters. By mistake I invited two reporters to write about the Livery Dinner at Newcastle Civic Centre so this excellent dinner is twice reported.*

*During the weekend our travel on the coaches was greatly enhanced by the very interesting commentaries by our Northumberland Blue Badge guides.*

*Raymond Cousins*



*The Master, Dr Robert Hawley and Mrs Pamela Hawley at Newcastle Civic Centre*

## ANGEL OF THE NORTH

On arrival in Newcastle the Master presented each of us with an umbrella. They were required only on the first morning when we visited the Angel of the North. The huge sculpture – 20 metres high with wings 54 meters wide - towered over us in light rain from an overcast sky. It was an impressive introduction to the North East.



*The Angel of the North*

The Angel is sited on a former colliery pit head baths, now reclaimed in a green landscape. It can be seen by travellers on the A1 and by passengers on the East Coast main line. Local opinion was initially uncertain but now the sculpture is proudly accepted as a defining landmark for Tyneside. None of the cost (£800,000) was funded by the local Council Tax.

The sculpture was designed by Anthony Gormley OBE who was born in 1950 and is at the forefront of a generation of celebrated younger British artists who emerged during the 1980s. He won the Turner Prize in 1994. The shape of the body of the Angel is based on mouldings from the artist's own body which were scanned by the Geomatics Department at Newcastle University to create an electronic 3D Virtual Reality Angel. This data was converted into a three-dimensional CAD model by Grafton Software so that computerised profiling machines were able to cut the main body into ribs following the exact curves of the artist's original castings.

Ove Arup and Partners were the engineers who used their skill and experience to help Anthony Gormley realise his vision. The structure was designed to withstand winds of more than 100 mph and was made in three parts – two wings and the body – from a special weather resistant Corten steel, which contains copper. The surface oxidises to form a patina which mellows with age to a rich brown colour.

The Angel of the North The fabrication was carried out by Hartlepool Fabrications Ltd on Teeside. The body weighed 100 tonnes and the wings 50 tonnes each. After a trial assembly on the ground the three parts were transported overnight from Hartlepool by road.

The sculpture was erected on foundations prepared by Thomas Armstrong (Construction) Ltd. The old mine workings were filled and grouted. A concrete slab, 1.5metres thick was laid covering an area of 13 m by 8 m supported by eight steel reinforced concrete piles to bedrock 20m below. The slab supports a plinth 5.3m high with 52 bolts each 3m long, to which the body of the sculpture is fixed. Once the body was secure the two wings were fixed, each wing secured with 88 bolts. The finally the skin plates were welded on and the supporting plinth backfilled and landscaped to provide a magnificent setting.

The design of the sculpture was commissioned in January 1994 . It took until April 1996 to secure funding. The fabrication contract was let in May 1997. Work began on the foundations in September 1997. the Angel of the North arrived on site in February 1998 and was officially 'launched' in June 1998.



*Foot Note!!*

We are grateful to Neil Carstairs and Richard Thurlow of Arup for the excellent presentation they gave on the Angel of the North after our site visit.

*Robin & Gillian Wilson*

## **ROBERT STEPHENSON ENGINE WORKS**

During its Out of Town Meeting, Members of the Worshipful Company visited the original Robert Stephenson Engine Works now run by the Robert Stephenson Trust at 20 South Street, Newcastle - the first locomotive factory in the world and the place where the *Rocket* and the *Planet* were built. On display was one of the famous *Grasshopper* type Engines built in 1823.

Robert Stephenson was an eminent engineer who succeeded his father George to become the second President of the Institution of Mechanical Engineers and later became President of the Institution of Civil Engineers.



*The Master clocking in with his Presentation*

The visit to the engine works was fascinating and depicted many details of Robert Stephenson's life as an engineer. He was the youngest working manager of a company, achieving this at the age of 19 (still a record). His company produced marine engines and bridges as well as a multitude of different designs of locomotive that were exported around the world in the

early part of the 19<sup>th</sup> century. He was of course the inventor of the *Davy* lamp. On display were some of the original intricate drawings (made when draughtsmen really were draughtsmen) and a very detailed history of the life of Robert Stephenson.

Also on display were some memorabilia including a working clocking on and off machine presented by the current Master, Bob Hawley, together with a plaque from the Worshipful Company and a cheque given to the Robert Stephenson Trust.

*Denis and Pamela Filer*

## **GATESHEAD MILLENNIUM BRIDGE**



*The Gateshead Millennium Bridge opening for a tug with the Ferris Wheel and Sage Music Centre in the background*

On the Saturday morning we visited the Millennium Bridge. Rising in a graceful arc over the river Tyne it draws the eye from every angle and adds another dimension to the view from the quayside or the water. Built, from concept to completion in five years, what an elegant piece of engineering it is!

With only one major moving part, and powered by 8 electric motors, it can be opened at the press of a button on the control console. The Master and Clerk had arranged for a special opening at 12.20. However, just as we arrived, a tug heading out to sea required the bridge to open and hence close to pedestrians. When the bridge returned to its normal position and we had



walked over to the south side our Master was duly accorded the honour of opening the bridge once again.

Some of the Engineers amongst us were concerned at the creaking and cracking noises from the structure as the bridge is opened and we were informed that Engineers from the University were studying the problem.

The appearance of the bridge is like an eyelid slowly opening but however it is viewed it is a unique structure. At night it can be illuminated in many different combinations of colour, which is a distinctive attraction to the quayside area, and by day, when the river is calm, it is perfectly reflected in the water below.

When fully open the top of the arch stands 50 metres above the water and stretches for 126 metres across the river. Built in the AMEC yard at Wallsend it was funded by the Millennium Commission, who paid the lion's share of the £22 million, together with the European Regional Development Fund, with additional input from English Partnerships, East Gateshead Single Regeneration Budget and Gateshead Council.



*The Master Opening the Gateshead Millennium Bridge*

Altogether it is a stunningly beautiful and very fitting engineering contribution and a rewarding visit.

*Tony and Naemi Best*

## **SAGE MUSIC CENTRE**



*The Sage Music Centre*

Newcastle/Gateshead is an urban area through which the River Tyne flows and on whose banks past industries flourished; they are now all gone. In their place new buildings stand and another new arrival is the Millennium 'Blinking' Bridge – a unique design, beautiful and effective. The rebuilding on both banks has rejuvenated the whole picture. One eye-catching building is the Sage Music Centre, a steel and glass construction, looking rather like a Foster-cousin of Cornwall's Eden Project. It is a squat, bulbous structure, an outer shell within which are contained three hall areas wholly devoted to music, not only its performance but to musical education and participation for all ages.

Why "Sage"? we asked before our visit, receiving several different incorrect answers! We now know that "Sage" is the name of a local software company, whose Engineer founder called Wylie provided £6m, pump-printing money for the project, which has taken ten years to plan and build.

It has been up and running for less than a year. Other benefactors have included the Arts Council, the Lottery, local authorities and trusts. Whatever traumas may have been experienced during the last decade, they can all now be very proud of what has been achieved.



The external appearance may provoke different responses but the interior is another matter. It has been designed and built with great attention to detail particularly in relation to the acoustical properties for which Arup Consultants were responsible. The concentration of effort has resulted in the finest music venue in the North East, in England, in the UK, in Europe or in the World depending upon your informant. Care with the acoustics has meant that there is no carry-over of sound from one hall to another. Other attention to detail design has resulted in the rehearsal space having the same response as he performance halls and that there is automatic adjustment according to the occupancy of an auditorium.

The layout of the concourse, foyer, restaurant and accesses from the outside are difficult to fault. We were told, but did not see the back stage areas and dressing rooms, they are apparently simple if not Spartan (in an attempt to encourage performers to mingle with their audiences, an interesting intention, but practicable?).

The Centre is for everyone and all types of music. There are rehearsal areas for those beginning to learn an instrument and for those preparing solo recitals, there are workshops. Indeed, the whole of the lower floor is given over to such facilities.



*Inside the Sage Centre*

There is a full-sized concrete hall seating nearly two thousand persons, a more intimate hall (350 people) for solo and chamber music, the latter having removable seating for dancing and pop concerts.

The Centre is the home for the Northern Sinfonia and for numerous tuition is available – the community as a whole is served musically.

The Sage Centre can only be described in superlative terms.

One wonders whether over time a few omissions and design faults may be found. The lack of an organ in the main concert hall may be regretted, although space has been left for one, building a large pipe organ in a constantly used environment would be a difficult task. And although Mozart's "Cosi fan Tutte" has already been staged successfully, opera on a larger scale or a musical would call for greater scenery storage and scene-shifting space than seems to be available. But perhaps we did not hear the whole story. What was clear was that visiting the Sage Centre was time well spent. Three cheers for the North East in bringing to fruition such an imaginative and inspiring project!

*Roy and Thelma Orford*

## **CIVIC DINNER AT NEWCASTLE CIVIC CENTRE**

Newcastle Civic Centre is the large 1960's building which houses all the main offices for the City along with formal reception facilities. The building is 2-star listed as an outstanding example of 1960 architecture. The frontage is impressive and the building is surrounded by a carillon which was added as a memorial several years after the building was finished and plays Tyneside tunes four times a day.

The dinner was hosted by the Sheriff and we were received by a Northumberland piper.

The instrument is similar to Scottish pipes but much softer (and more pleasant?) and aroused considerable interest. Before dinner we had a reception while the piper played overlooking the main dining hall.



*The Northumberland Piper*

Dinner was the usual splendid occasion with a high table (including the Master, the Sheriff and Lord Walton). Freemen of the City of Newcastle were inscribed around the wall.

At the dinner the Master gave his normal entertaining speech followed by Lord Walton of Detchant.

Lord Walton gave a highly amusing account of his past relationships in Newcastle where he had been Dean of Medicine at the University. This brought to an end a most enjoyable and entertaining evening with good fellowship all round.

*John and Doreen Robinson*

## **NEWCASTLE CIVIC CENTRE DINNER (2)**

After a very entertaining and educational day we all piled back into our respective coaches in our evening refinery, the golden sunset gleaming on the engineer's many decorations and regalia.

Approached from the south side Newcastle Civic Centre gives the impression of 1960's brutalism, which is saved by its corona of a dozen gentle seahorses surrounding the three castles from the city's Coat of

Arms. This lantern tower houses a carillon that plays traditional Tyneside ditties four times a day.

The entrance is adorned with a dramatic bronze of the river god Tyne continually pouring water on to the paving beneath though, thankfully, missing the actual doorway. There are many other works of art in this magnificent building which, unfortunately, I missed, not because I was over anxious to get to the champagne, but more to find the source of the delightful music.

At the top of the grand staircase with its wide, shallow steps and gorgeous red carpet, stood a lone piper. Not the kind who daily awoke the late Queen Mother when she stayed at Glamis Castle but the Northumbrian sort, so much more suited to indoor recital. His music not only enlivened reception but played us all into dinner, circulating amongst the tables and chatting all the while, another advantage over the Scottish variety.

The dinner of roast duck preceded by gravadlax and followed by apple strudel with its accompanying wines was of the unfailingly high standard one has come to expect of Company dinners. So it was that we settled down happily to listen to the Master introduce first his other guests and then his old friend, Lord Walton of Detchant.

Lord Walton explained that his surname was considered rather similar to that of other peers and so he had to qualify it in some way. He chose Detchant as it is where he lives now, along with at least twenty-two other inhabitants and is such a charming place he was very pleased to have the opportunity of drawing public attention to it. Before proposing the health of the Company he told several very good jokes, none of which I am going to be so mean as to tell here because I could see people quietly scribbling them down for later use!

So the elegant evening ended but the entertainment was far from over. Creeping through the one way system late on a Friday night, from our vantage points in the coaches we were able to view the young, for whom the party was just beginning. There are some 40,000 students in the City and at a rough guess, 35,500 were on pleasure bent that night. In groups of four or five, the boys stood around, hands in pockets, watching the girls as they chattered away, laughing

and giving friendly waves to us old fogies. "I wonder where all those old people are going at this time of night? Home to bed thank you, we have had a lovely time."

*Ann Bawtree*

## **BAMBURGH CASTLE**



*Bamburgh Castle*

On Saturday 24<sup>th</sup> September, we set off, accompanied by our excellent Blue Badge guides for Bamburgh Castle.

Superbly set on a craggy promontory of the Whin Sill, the Norman Castle was restored in the 1890s by the first Baron Armstrong, an Engineer and munitions magnate. It appropriately contains a notable collection of armour.

The castle was founded in the 6<sup>th</sup> century and was the seat of the Northumbrian Kings. It was rebuilt by both Henry II and Henry III as a bastion against the Scots. David II of Scotland was imprisoned there after his defeat by Edward III at Neville's Cross in 1346.

William George Armstrong was born in Newcastle on November 26<sup>th</sup> 1810. His father was a corn merchant and William was destined for a career in law, but his main interest was engineering.

Abandoning law in 1847, he founded the Engineering works at Elswick – on –Tyne, in order to build hydraulic cranes. He conducted scientific experiments and invented high pressure hydraulic machinery. In 1850 he developed a hydraulic accumulator, which enabled the pressure in the supply pipe to be raised to 600lbs /square inch, so that hoists, capstans, turntables and dock gates could be worked anywhere. He was an English engineer who revolutionised the manufacture of large guns . Some of his guns were used in the Crimean war He invented a hydroelectric machine which generated electricity by steam escaping from an insulated boiler through nozzles. He also improved ordnance for the British Army in Crimea. He was knighted in 1859 and was appointed Director of rifled ordnance, Woolwich. However, he resigned in 1863 and returned to the Elswick works.

He was elected a FRS in 1887 and later President of the British Association. He had a strong interest in shipbuilding . Royalty visited his house Cragside in Northumberland. He bought Cragside for £60,000, and it cost about £1 million to restore. Lord Armstrong died at Cragside on December 27, 1900.

The second Lord Armstrong married an Italian lady he met in the second world war. He and his wife adopted two children, but they could not continue to inherit the title.

**BAMBURGH CASTLE** has been used as the location for a number of films (Huntingtower, 1927, Beckett, 1964, the Devils, 1970, Mary Queen of Scots, 1971 and Macbeth, 1972). The furniture is mainly from the period 1700 -1800. The main hall includes a musicians' gallery. There is also an Aircraft museum which has records of enemy planes shot down and of British civilians killed by enemy action. He built a number of cottages in the village to provide homes for the families working there. There are superb views of Lindesfarne from the village and the castle.

In the churchyard of Bamburgh Parish Church is a monument to Grace Darling.

On a stormy night on September 7<sup>th</sup> , 1838, she rowed with her father – the Langstone Lighthouse keeper - to rescue the nine survivors of the Forfarshire, wrecked on the Farne Island rocks a mile away.



Grace Darling was born at Bamburgh on 24<sup>th</sup> November, 1815. Her father, William, was keeper of the Longstone (Farne Islands) lighthouse when the Forfarshire struck rocks. The seas were too treacherous for the mainland lifeboat, but Grace and her father managed to row the mile from the lighthouse in their coble and by a combination of daring, strength and skill rescued four men and a woman. Grace then returned to take off the remaining four survivors. She won nationwide fame and she and her father were given the Gold medal of the Humane Society. She received many offers of marriage, which she refused and decided to remain in Northumberland. She was the subject of a poem by William Wordsworth.

Grace died of TB in 1842 at Bamburgh. She is buried in the Churchyard at St. Aidan's Church. The lifeboat they rowed has been placed opposite the Churchyard.

*Heather Liddell and Alan Poole*

## **ALNWICK CASTLE GARDEN**

Jane the Duchess of Northumberland has been making enormous splashes in the world of garden design. She arrived at Alnwick Castle with her husband and children to make it their home after the sudden death of her husband's brother. The Duke was concerned that she should feel able to make it her place too and offered her the challenge to re-do the gardens.



*The Cascades*

She has taken her inspiration from gardens beyond the beginning of the civilised world. Indeed it might be said that gardens make a civilised world. Vitruvius was architect and engineer to the Emperor Augustus who designed elaborate fountains and running water for gardens in Rome. The garden of Hampton Court was made by William and Mary with clipped green topiary in the Dutch style. Young rich men like Richard Boyle 3<sup>rd</sup> Earl of Burlington did the grand tour and discovered these ideas along with the buildings of Palladian whose classic designs set the rules for William Kent and the others who followed. The water gardens of Chatsworth were world famous and these in turn influenced the plans of Joseph Paxton for the pleasure grounds of Crystal Palace.

All these ideas are to be found in the gardens at Alnwick. In a most ambitious long term plan the Duchess has turned the Gardens of Alnwick Castle into a garden for the 21<sup>st</sup> Century. The spirit of almost every garden ever designed is to be found in the 8<sup>th</sup> Garden on the Castle site.

Capability Brown had landscaped surrounding parkland using his tree planting skills to bring the estate right up to the castle walls. The modern designs of Sir Michael Hopkins and of the father and son team of Jacques and Peter Wirtz are being quickly realised. The old kitchen garden is set out at the top of the garden like Villandry but given the modern twist of pleached fruit trees and tall plantings in the parterres. The central pond with four rills is a favourite idea used by Gertrude Jekyll. The pond or fountain represents the source of life in the Garden of Eden which fed four rivers. Many of the earliest castles had a similar place of refuge for the ladies of the Mediaeval Castle and the mille fleur tapestries of the Lady and the Unicorn were inspired by these.

The Alnwick gardens have some beautifully restored Venetian gates which divide the flower garden from the Chatsworth inspired Grand Cascade. The elaborate water displays are driven from the pump room beneath. A most interesting visit stimulated a number of questions from our group.



*The Alnwick Rose*

David Austin has given and maintains a rose garden of 3000 roses which include the Alnwick Rose named at the 2001 Chelsea Flower Show. It is fragrant rich pink bloom in the French old rose tradition. We were still able to enjoy the roses which had been blooming for the whole summer.

In the Arbour was a magnificent Fox Urn which the 4<sup>th</sup> Duke purchased with his gambling winnings.



*The Fox Urn*

The engineers' and the childrens' delight is the serpent garden. At each turn of the holly hedge snake There is a different watery surprise by William Pye. Whether it is the Vortex or Ravine, the Torricelli or the Meniscus the visitor is encouraged into full audience participation. No local family comes without a change of clothes for the younger members. The pump room was discovered through the infamous poison garden where we were brought face to leaf with the realisation that most of our favourite flowers could cause serious illness or worse to all if touched or eaten unadvisedly or wantonly...

Some of our adventurous members tried the tree house in the interests of checking it out for the grandchildren and declared it really fun. Wheel chair users had been part of the planning team and the whole enormous gingerbread style house is just waiting for the next all age family birthday treat.

Here indeed is a busy new place to see. The planting is simple and yet to mature but the features are setting the pace for the new century. Indeed it is an engineers' garden – structure and action enhanced by well chosen, controlled planting.

*Ruth Cousins*

## **DINNER AUCKLAND CASTLE**

As the sun set, once more we drove past the Angel of the North on our way to Auckland Castle for dinner at the official home from 1832 of the Bishop of Durham. Built in the 12<sup>th</sup> Century the Castle had been for 600 years the hunting lodge the principle country home of the Prince Bishops of Durham. Part cleric, part soldier and part politician, the Prince Bishop was a virtual monarch reigning over the North on behalf of the King providing a buffer between the Scots and more peaceful elements of the English.

The evening began with reception drinks in the Gentlemen's Hall before moving to St Peter's Chapel. Reputed to be one of the largest private Chapels in Europe it was originally the great banqueting hall. A fine example of a medieval aisled hall, the ceiling and fine marble sculpture gave particular delight. Here we were entertained by one of the Castle's Historic Guides, who gave a fascinating insight into the history

of the Castle and who pleased the naval element of the party as he was wearing a very distinctive RN Association tie. The talk concluded by the warden and Master swapping amusing Geordie anecdotes.

Dinner was served in the Throne Room which has a notable high vaulted ceiling and is dominated by the throne itself with fine portraits of the past Bishops with Archbishop Ramsey affectionately recognised by all. Table flowers were stunning – thanks to Pamela. After dinner we were given a further splendid exposé of the history of the room. The Master’s speech followed recounting highlights of our days together before he unleashed a fiendish quiz to test the mental prowess of the assembled diners. No prior warning so no chance to swot up and those who thought they were ‘good’ at pub quizzes were in for a shock. To be even able to compete you had to be born well before 15<sup>th</sup> February 1971 and then remember farthings. Ten cryptic questions requiring an answer in £ s or d, not p’s the answer sheet erroneously requested, tested one and all. As an example – “Mars, Jupiter and Neptune?” Answer three far things! The Middle Warden’s table was declared the winner but only after an appeal to the stewards with the Masters decision being ruled as final.

After the hubbub died down, the Junior Warden presented the Master with a gift of four books each featuring the North East – Hadrian’s Wall, Northumbrian Countryside, Newcastle and the Tyne, Source to Estuary, with all our thanks of a splendid and memorable Out of Town visit.

Coffee was served in the Long Dining Room where we were surrounded by the truly magnificent Francisco de Zubarán paintings of Jacob and his twelve sons not forgetting Joseph and his Technicolor dream coat.

An excellent meal in superb surroundings to round off a visit of interest and fun before the church service in Durham Cathedral on the Sunday

*Malcolm & Linda Vincent*

## DURHAM CATHEDRAL



*The Cathedral from the Green*

Approaching Durham from the north, on a sunny Sunday morning, the skyline is dominated by the mammoth structure of the famous Cathedral; the adjacent Castle seems a mere cottage by comparison. The walk up through the town is delightful with the shops and houses having a warm community feel compared to what seems the sombre and dominatable character of the Cathedral building.

Led by the Master and Pamela, approximately 40 of the Newcastle Out-of-Town party attended Sung Eucharist in the Cathedral, the service being led by The Archdeacon of Durham. The Cathedral was reasonably full and the Worshipful Company of Engineers was given a special mention by the Archdeacon in welcoming visitors amongst the congregation. The sermon was given by the Reverend Stephen Hampton (a future Bishop if ever I saw one) who gave both an informative and amusing address on the importance and value of humility

Durham Cathedral is amongst the greatest churches ever built and is primarily in the Norman Romanesque style, with the Rose Window being an addition which was later remodelled during the eighteen Century. The planning and early construction was begun by Bishop Carileph in the period 1081 -1096; the Nave, Quire and the North and South Transepts were built between 1093 and 1133. There then followed the construction of the Galilee Chapel in 1175, the two western Towers in 1217-1226 and finally the Gothic styled Chapel of the Nine Altars between 1242 and 1280. The Cathedral



was also the Church of the Benedictine Monastery up until 1540.

There are a whole range of historical features within the Cathedral, but of particular interest is St Cuthbert's Shrine, the tomb of the Venerable Bede and the Chapel of the Nine Altars. St Cuthbert is considered to be the greatest Saint of the North and died in 687 as the then Bishop on Holy Island (Lindisfarne). In 995 his bones were moved to Durham and initially housed in a Church built specifically as a shrine by the Monks, but later moved to the new Cathedral in September 1104.



*One of the altars furthest to the East of the Cathedral*

At the opposite end of the Cathedral is the tomb of the Venerable Bede, that famous scholar who wrote the first history of England titled 'The History of the English Church and People'. He died in 735 and again his bones were brought to new shrine in the Cathedral in 1370. The Chapel of the Nine Altars is immediately adjacent to St Cuthbert's Shrine and was built to meet a specific need; there were so the many priests in the Monastery who required to say Mass each day, plus the space required to allow the visiting crowds visiting the shrine, that the only way this could be accommodated was to build Nine Altars.

Following the service we were able to enjoy a true northern Sunday lunch with Yorkshire puddings that would have sustained half the British Army for the day. From there homewards to a rest after a most enjoyable and delightful visit to sunny Newcastle.

*Tony and Jeanette Roche*

*To demonstrate that we only managed to scratch the surface of all that the beautiful North East can offer, Brian Cook stayed on for a couple more days and below is his report on a visit to Cragside and to see the Ship Turbinia. Also to be enjoyed is the wonderful coastline and golf courses as well as the marine life and birds. It revived many memories for me and I cannot wait to go back again.*

*Next year it is to the South West to see the Eden Project amongst many other treasures. The bubble roof of the new visitor centre at the Alnwick Gardens gave us a taste of the roofs of the great Biomes at Eden so put a note in your diaries , 14 – 17 September 2006.*

*Raymond Cousins*

## **CRAGSIDE AND THE TURBINIA**

We had a packed programme for the visit to the North East and we could not have done more in the time available, but there were many other interesting things to see. I stayed on for an extra night to visit just two.

Cragside, Armstrong's country house, is near Rothbury about thirty miles North of Newcastle. The house and estate are now in the hands of the National Trust. The house is interesting rather than beautiful. Most of the rooms are quite modest in size apart from the grand Drawing Room which demonstrates Victorian design at its most florid, especially the great marble fireplace. The house avoids the rather sterile effect of too many National Trust houses because it retains a large number of the personal furnishings and possessions of the family. There are various hydraulically or electrically operated devices and these are perhaps the most interesting feature. It was the first house in England to be lit by electricity from hydro-electric power, later replaced or assisted by power from a gas engine after Armstrong built his own small gas works because the water supply was insufficient one dry summer. Could there be a lesson there for our renewables enthusiasts? The house is now connected to conventional mains power but the bulbs used simulate the effect of the original 110 volt DC. I wondered how people reached such a remote place

before the motor car and found from a map as recent as 1959 that there used to be a railway from Rothbury to Middleton and then across to Morpeth where it joined the main North-South line. It is hard to see how the line could ever have been economic so Armstrong may have subsidised it. Cragside is now to be closed until early 2007 for extensive re-wiring although it was re-wired once before in the 1930's. I believe that Cragside was considered for our visit but it would not have been suitable for a visit by such a large party and it was not as interesting as the places that we did see.

If Cragside shows heavy Victorian taste, the beautiful little ship Turbinia shows Victorian engineering daring and genius. Jan Williams, our excellent guide on coach 1, had pointed out the Discovery Museum in Newcastle and told us that Turbinia was on display there. It is an amazing sight; imagine not a ship but a marine version of a fighter aircraft. Turbinia is 100 feet long but just nine feet wide and displaced only 44.5 tons with very low freeboard. She was coal powered with the coal and stoke-hold towards the front part of the ship. Conditions were so cramped that although there were several stokers only one could actually work at a time. They must have worked hard because Turbinia generated 2,000 horse power from three steam turbines. One turbine ran on the high pressure steam and discharged to the intermediate pressure turbine on the other side of the ship. Steam then passed to the low pressure turbine on the centre line and to the condenser. Each turbine drove its own propeller shaft without gear reduction and each shaft had three propellers. The rudder was offset between the port and centre shafts. Turbinia was only intended as a demonstrator of the steam turbine, not as a working ship, and she was built as lightly as possible with no plate thicker than three sixteenths of an inch and some only one sixteenth. She famously reached over 34 knots at the Spithead Review in 1897, far in excess of the best speed of any other vessel. It is reported that at top speed flames came out of the short funnel, which had to be repainted after every run.

Everyone on deck was routinely drenched on high speed runs.

The Discovery Museum also has a beautiful large scale model (1/48) of the Tyne-built liner Mauretania, probably the best loved and best looking liner ever

launched anywhere. A model of little Turbinia to the same scale nestles at the foot of the display case, not much bigger than two of Mauretania's lifeboats.

The very conservative Cunard Line chose turbines for the first time for the similar but not identical Lusitania, built on the Clyde, and for Mauretania because of their evident advantages. Both ships made their maiden voyages in 1907, just ten years after the demonstration by Turbinia, and Mauretania soon took the Blue Riband which she held for twenty years, longer than any other ship. The American author Stephen Fox wrote in his history of the trans-Atlantic liners that 'The Mauretania was the greatest steam ship ever built. On the roll-call of North Atlantic steamers, no other ship so combined technical innovation, speed, profitability and longevity. Another might have surpassed her by one or two of these criteria but none was so distinguished in all five ways.'

I am sure that many members of the party will want to go back to Newcastle. Turbinia and the Mauretania model alone would justify a long journey.

*Brian Cook*

LADIES LUNCHEON - 5 OCTOBER 2005

This is one of the highlights of the year for an Engineers' Lady.

Around 40 Engineers, Engineers' Ladies and their guests attended this year's luncheon. There was no disappointment when Mrs Pamela Hawley took the chair, greeting all of us in another stunning outfit. She selected a delightful meal for us; light enough for those of us who usually take what comes to hand in the course of a busy day and elegant enough for us to all feel cherished.

Our caterer presented the whole meal beautifully. A tatin of warm goats' cheese was followed by a perfectly prepared grilled salmon. The wine was very carefully chosen as each complimented the food to perfection. The pre-lunch reception had given us the opportunity to both meet our special guests and to catch up briefly with personal news.

Baroness Pauline Perry was the principal speaker. Mrs Hawley had met her when travelling abroad in the Far East. Our own Baroness Lady Platt had spent time and working with our speaker in the House of Lords and we were entertained with the trials and triumphs of female members of that Upper House.

We all have admiration for women who have found time in their lives to take up the challenges of competing with and working along side men taking their turn in working for the public good. Baroness Perry told of both conquests and challenges and of things not usually mentioned in other circles. Baroness Platt was both ally and witness.

Mrs Pamela Hawley compèred the whole lunch. She led the Grace, proposed toasts to the Queen, the Lord Mayor and the Corporation of London. She introduced the speaker and toasted the Engineer's Company.

We were also delighted by her speech. Many of the ladies present have spent a life time working with and following their men folk on various visits. We were pleased to discover that, in common with many others, holiday and family outings often have a hidden agenda. The Master, we understand rarely misses an opportunity to visit power stations. Others of us visit very different places. We do all listen and understand. Our Lady Engineer's description of a pebble bed nuclear power station which she likened to a chewing gum machine made it all clear.



*The Master's Lady, Pamela Hawley and Baroness Perry*

The fitness for purpose in particular circumstances – in this case South Africa was understood. The conviction that nuclear power as the right answer and was bound to come soon was made quite clear.

Mrs Mary Gibson thanked both Mrs Hawley and Baroness Perry. She expressed for us all that the occasion had been a very special one. We are indeed a most fortunate Livery to have such a fine setting for such a lovely part of our tradition.

*Ruth Cousins*

**THE MASTER'S LADY'S SPEECH**

It gives me such pleasure to welcome everyone here today. I do feel unbelievably honoured to be hosting this luncheon and wearing this wonderful brooch.

A particular welcome is extended to guests of our Company's ladies and a special welcome to my guests, Baroness Pauline Perry of Southwark, of whom more later, and Jean Jefferies, whose husband is currently Master of the Worshipful Company of Wax Chandlers, which makes Jean Master's lady, and therefore this is really Jean's dining room.

I would like to thank the catering staff whom have produced such a delicious meal and looked after us so beautifully. And speaking of looking after I must say how much Bob and I appreciate the work, effort and support that our Clerk, Graham Skinner, and our Beadle, Stephen Grundy, give both us and the company - their guidance is invaluable.



One other person who cannot be missed out is Margaret, wife of our Clerk, a great friend and huge support on all occasions.

I have a small story to tell about Margaret and me. We were in the north east with Bob and Graham and had just one last venue to reconnoitre for the Company out of town visit – which a number of the ladies here today have, I hope, recently enjoyed. Alnwick Castle said they had a good venue for the final banquet on the Saturday night and we paid our deposit imagining the glorious castle hall complete with tapestries and regalia that awaited us. In the event we were shown into the converted stables with more stuffed animal heads on the walls than are probably still running around in Africa. Margaret and I were aghast and both in the same breath said, “I couldn’t possibly dine in here”. Needless to say Alnwick kept our deposit when we decamped to Auckland Castle, home of the Prince Bishops of Durham, which only had a few bishops heads on the walls.

The Master and I very much enjoyed hosting the Company trip to the Thames Barrage and in view of the disaster of the levees in New Orleans, hope that it is adequate to protect London. There have been lots of other outings to different venues, all of which have been immensely enjoyed by Bob and myself on behalf of the Company. We are going to St Paul's to celebrate the 400<sup>th</sup> anniversary of the Royal Charter given to the Worshipful Company of Butchers later today – so you see the activity is pretty constant.

I wonder if your life as wife or partner or even as an engineer is in any way similar to mine. Bob and I go everywhere by power stations and believe me, wherever we go there is always a power station.

Bob will tell me, as it looms into view, who built it and commissioned it, who designed it, who the chief engineer was, whether it is coal, oil, gas or nuclear fired, how many megawatts it produces, the name of the tea lady and, most importantly of all, whether he had any hand in the design and production of the turbine generators which would have been made on Tyneside.

To illustrate further, we were in South Africa recently on holiday and I knew before we went that Bob had fixed up a visit to the pebble bed nuclear reactor module project near Johannesburg. However, an hour before we left a message came to ask if he would

speak on the international nuclear scenario at the South African energy conference – he was in seventh heaven, not only was he visiting a nuclear power plant but he was also going to talk nuclear and all while he was on holiday.

I thought I might do something a little different today. Sometimes one has to be absolutely fascinated when an engineer is waxing lyrical about his or her favourite project. I thought you might enjoy some engineering information that you could use to fascinate in return. So how about the unique pebble bed reactor project in South Africa, which not many people know about. This is by the way not a plug for nuclear, it's just that I am so proud to be married to an engineer.

This was a British invention that is currently being developed and tested by the South Africans. These particular reactors come as quite small modules which means that they are useful if only a smallish community or area needs to be supplied with electricity and you are conscious of the effects of carbon dioxide on global warming.

More modules can be added as the community grows or the need arises, such as the arrival of a factory. Each module produces about 165 megawatts of electricity as opposed to Sizewell B here in England which produces about 1200 megawatts.

Now to the technical bit – instead of radioactive rods, which in the case of Sizewell B are half the height of St Paul's, the pebble bed modules use radioactive pebbles which gradually make their way down the reactor and out of the bottom. A bit like the balls in a bubble gum machine but definitely not like the balls in the lottery which are bouncing around and then dropping down.

One of the many advantages of this process is that it is so much easier than removing and replacing these huge rods which involves shutting down the system. With the pebble bed you just put a few more pebbles in the top. – isn't engineering marvellous!!

And now just for fun I bought a pebble with me to show you. I think it's more like a ball than a pebble and I promise you that it's not charged. I think the alarms would have gone off at the airport and anyway it doesn't glow in the dark.

When each pebble is charged it will have 10,000 of what they call poppy seeds of radioactive material inside. As these pebbles work their way down the

reactor they gradually use up this material and eventually end up like this one. Only joking – this pebble has definitely not been in a reactor!!

Whilst we are talking about energy production Baroness Perry has just finished a House of Lords consultation called ‘Energy Efficiency’ along with, amongst others, our own Baroness Platt. We are apparently as a nation profligate in our waste of energy. A matter that has to be addressed.

I first met Baroness Pauline Perry on a bus. Not your average £1.20 bus from Waterloo to wherever in London but more a 5 won bus from Seoul to Insadong in South Korea. In fact I think it was a bus taking us all to a reception at the Blue House on the occasion of her Majesty the Queen’s visit to South Korea.

I was there coat tailing Bob who was at a conference but Baroness Perry was there very much in her own right.

She has had a most extraordinary career, her passion being in education, but her interests and knowledge range far and wide. I can give you only the briefest synopsis of her CV otherwise she will have no time to speak to us.

Starting from her days in Cambridge, where she met her lovely husband George, to whom she has been married for over 50 years. Her career has taken her to America and Canada, both teaching and lecturing, and then to Oxford.

She became an inspector and then chief inspector for schools. She has been on innumerable advisory panels to governments on subjects as diverse as citizen's charters, science and technology, police training and relationships between local councils and central government, amongst many others.

Books and papers have followed in profusion as have university honours and positions and amongst the serious publications I noticed one particularly entitled “Your Guide to the Opposite Sex”, which I will look out for. One is always in need of advice!

Pauline was elevated to the House of Lords in 1991 as Baroness Perry of Southwark and I would like to invite her at this juncture to speak to us all.

*Pamela Hawley*

## SECOND INFORMAL LUNCH 9 OCTOBER 2005



*Philip and Elizabeth Hawtin  
John and Pat Huffell  
Peter and Diana Blair Fish*

Encouraged by the enthusiastic response to her first informal lunch in June, Penny Taylor arranged another at the same venue.



*Roger and Vida Voles  
Ken and Majorie Slater  
Tony Roche*

We drove to the Mill House Hotel at Kingham on a bright sunny day through the delightful Cotswold countryside where the autumn colours were just starting to appear.

The group, at 28, was larger than in June, with many couples becoming “regulars”. The lunch was as delightful and plentiful as before and some of us resolved not to eat again for the rest of the day!

clearly showed that these lunches are very much appreciated and, hopefully, are here to stay. It is a superb way to bond.



*Astley and Diana Whittall  
Lawrence and Jean Turner  
Winifred Mitchell*

Over coffee, the Master rose to thank Penny and Phil on our behalf for having brought us together again on such a pleasant occasion.



*The Master and Pamela Hawley  
Penny Taylor and Philip Abbott*

We look forward to the next informal lunch which Penny will be arranging.

*Roger & Vida Voles*

## **THE BRIDGE LECTURE 8 FEBRUARY 2006**

In conjunction with the City University the Company held its 10th Bridge Lecture at the University on 8 February. This Biennial lecture was inaugurated in

1988 to provide a bridge between those who practice engineering and those who benefit from the services of Engineers. This years lecturer was Dame Judith Mayhew Jonas DBE and her stimulating and thought provoking paper on The Arts, Engineering and Technology with particular reference to the Royal Opera House is reproduced in the on-line Swordsman at [www.engineerscompany.org.uk](http://www.engineerscompany.org.uk).



*Dame Judith Mayhew Jonas*

Dame Judith is Provost of Kings College Cambridge and Chairman of the Royal Opera House and was formerly Chairman of the Policy and Resources Committee of the City of London Corporation and Vice Chairman of the London Development Agency.

The lecture was introduced by Professor David Rhind, the Vice Chancellor and the Master and the Middle Warden proposed a vote of thanks. After the lecture the City University generously hosted a buffet reception at which the discussion continued to range widely.

On show at the reception area was a Formula Student Racing Car made by the students at City University (photograph on front cover).

A donation from the Company's Charitable Trust was made to the University to support this project which encourages the ingenuity of the students in creating their racing car. This programme is undertaken in several universities so we wish the students of the City University well when they race their car.

*Raymond Cousins*



## ANNUAL BANQUET MANSION HOUSE

28 October 2005

It was a full house of civic dignitaries for the Engineers' Company Annual Banquet at the Mansion House. The Right Honourable The Lord Mayor, Alderman Mr Michael Savory, and the Lady Mayoress, Mrs Fiona Savory together with the two Sheriffs and their ladies, respectively Mr Alderman and Sheriff John B Studdard with Mrs Lesley Studdard and Mr Sheriff Kevin Kearney and Mrs Mary Kearney were all present to be welcomed warmly by the Master, Dr Robert Hawley and Mrs Pamela Hawley.



*Guests assembling at the Annual Banquet*

There was also the Korean Ambassador, Dr Cho, Yoon-Je and Mrs Woo Sun-ae with Sir John and Lady Morgan plus the principal speaker and guest, Sir Paul Newall and Lady Newall who, like the Master, had close diplomatic connections with Korea. The Rt. Hon. Lord Wakeham was on his own on this occasion but Sir Chrispin Tickell, ex UK Ambassador to the UN and Mexico and Mr Stephen Green as Group Chief Executive HSBC were able to be there accompanied by their ladies. The Master had also invited, as his personal guests, the Vice Chancellors of those UK universities with which he had an academic association and five of them attended. There were also eight Masters and one Prime Warden and their ladies of the City Livery Companies who joined us; these were the Cutlers, Wax Chandlers, Blacksmiths, Plaisterers, Paviers, Shipwrights, Clock Makers, Scientific Instrument Makers and Information Technologists.

Overall there were 174 members and guests dining that evening to a main course menu of: 'Supreme of Sea Bass baked with Wild Mushrooms and Thyme-scented Potatoes' with a 'Duck, Potato and Truffle Confit' starter and 'Bailey's Brioche Butter Pudding with Vanilla Ice Cream' for dessert with a 'Scotch Woodcock' savoury to finish.

The Band of the Corps of Royal Electrical and Mechanical Engineers played from the Egyptian Hall Gallery a varied and interesting programme with gusto throughout the meal and, especially, for their final piece of US nostalgia.



*The Master, Dr Robert Hawley*

After two loyal toasts, the Master spoke and his speech is reproduced in full later and concluded with the Civic Toast. The Lord Mayor responded to this together with the gifts including a cheque for £500 to the Mansion House Scholarship scheme from the Company with some very complimentary and well-chosen comments: a copy of his speech is also included below.

As is our custom, the Junior Warden, Mr Tony Roche, welcomed our guests and concluded with a toast to them. In response and on behalf of the guests, Sir Paul Newall, spoke wittily and confidently as a former Lord Mayor and ended with a toast to the Company.

Overall, it was a splendid and glittering occasion that went very well from every perspective and was greatly enjoyed by all those who attended.

*Graham Skinner*

## **MANSION HOUSE SPEECH BY THE MASTER, DR ROBERT HAWLEY**

Wardens, My Lord Mayor, Your Excellency, My Lord, Sheriffs, Prime Warden, Masters, Ladies and Gentlemen.

It is wonderful to welcome you all here this evening and also for Pamela and I to be surrounded by so many influential friends, who recognise the importance of engineering.

Without engineering it would not be possible to carry out basic scientific research. Without engineering, scientific discoveries cannot be turned into technology and hence, wealth creating products. For example, in these days, faced with the rapid growth of information and knowledge flows, the so-called creative industries – the Arts – the Graphics – the Digital World, - are one of the major growth areas in the UK economy and they would not be possible without engineering.

Pamela defines the Arts as activities that lift the spirit and do not depress the soul. It fascinates me that opposite those two great centres for the Arts in London, The Royal College of Arts and the Royal Albert Hall, stand the four corners of the Albert Memorial representing engineering, manufacturing, agriculture and commerce. Areas that made the UK great in the Victorian era. In other words a stable four-legged stool. However, engineering, heavy manufacturing and agriculture are all disappearing in the UK, leaving the one-legged stool of commerce, albeit ably supported by technology.

We are all well aware of the enormous advantages that the rapid growth of technology has brought to our physical and mental well being. But are we aware of the dangers it brings with it?

Our world today is under constant threat. Threats that already exist – such as terrorism, war, famine, disease, water shortages and natural disasters. And there are the threats that will occur because we are increasingly polluting our planet.

In the last few years global warming, caused by the Greenhouse Effect, is the issue that is on everyone's agenda. To be blunt, as stated by Sir David King, the

Government's Chief Scientific Adviser, it is a bigger global threat than terrorism.

Modest temperature increases can have devastating effects worldwide, causing massive change. For example, it is predicted that unless something radical is done the mean sea level will rise 6 cm per decade over the next century.

As nearly one third of mankind lives within forty miles of the sea, where the land tends to be the most productive, and more than 100 million live within three feet of mean sea level, it has been estimated that a modest sea level increase, of only a few centimetres, could drive millions of people from their homes, creating a new kind of environmental refugee. Indeed, Sir David King, has recently warned that London itself could be flooded. Remember you are now sitting close to the mighty River Thames!

My Lord Mayor, take comfort from the fact that this Company visited the Thames Barrier in June this year to check it was working properly!

The world we are creating today will determine the outcome of a number of issues and conflicting demands, which we are only now, more clearly, beginning to identify. The way in which we resolve these, — and Engineers will play a major role in the process — will fashion the world in which you, your children, your grandchildren and your great-grandchildren will live. But the immediate challenge, during our lifetimes, will be to provide enough energy, water and food to raise the standard of living of the ever increasing world population without “imperilling our irreplaceable environment” — and there is a great deal to be done.

Of the six billion people in the world today only two billion have reliable access to electricity, two billion have unreliable access, leaving two billion with little or no access, of whom one billion live in slums. Today 2.4 billion people are dependent on wood, crop residues and dung to cook their food.

I said Engineers would play a global role in resolving global problems but so to will the Financial Institutions, who have to finance and sustain remedial projects that will raise the standard of living in developing countries and at the same time reduce future threats.

This is where there is a vital role for our Company to continue to assist in increasing the understanding

between Engineers and the City and the City and Engineers. In that respect I trust a contribution, from the Company, that I will later pass to the Lord Mayor, for his Mansion House Scholarship Scheme, will help to strengthen that understanding.

The City does, however, already know that nothing happens without Engineers. Not only in providing the infrastructure and communication networks that the City is totally dependant upon, world's physical problems.

In my early life, having been responsible for supplying a great deal of electrical generating equipment to power stations in Iraq, I was very struck by the effects caused by lack of power generation in Baghdad after the war. Electricity that provided light for security, electricity that provided heat and cooking facilities, electricity that pumped water and more importantly foul water, was not available.

And who was it who returned the supplies of electricity? Our Armed Forces - who are so well represented here tonight and always welcome at our table. Incidentally they can also have the opposite effect. When I was MD at Parsons, one of the Power Stations we built in Iraq, using British Aid, was later blown up by the RAF as a result of the invasion by Iraq of Kuwait. The great irony was, the leader of the RAF attack was the son of the Commercial Director of Parsons who negotiated the Contract for the Power Station in the first place!

Tomorrow I will be asking one of our Honorary Liveryman, the Chief Royal Engineer (in his capacity as Chief of Defence Logistics) to convey our thanks and deep appreciation to the Defence Council for the skills and loyalty of our Armed Forces and to assure them that they have our full support wherever they are in the world.

In a year, that last week saw the 200<sup>th</sup> Anniversary of the Battle of Trafalgar and the 60<sup>th</sup> Anniversary of VE Day in May, it is significant, My Lord Mayor, that your major appeal is to help heroes and their families from the worlds of the Armed Forces and deep sea fisherman.

As I said, the future wealth of the UK will depend on its ability to carry out world class science and turn scientific discoveries into competitive products. However, we are currently living on our inheritance from the past and failing to recruit bright youngsters into science and engineering. What are we going to

leave to future generations when, in spite of recent, major attempts to rectify the situation, our education system is at times inadequate, our basic manufacturing skills are being eroded and our key energy generating industry is rapidly becoming totally dependent on gas imports?

These are significant problems of a strategic nature which have been emerging for number of years but have yet to be solved by the implementation of consistent, high level policies by the Government.

How different it is in Republic of Korea who has defined, agreed and kept to, a strategic plan of growth based on engineering and technology. His Excellency, the Ambassador of South Korea and his charming wife do us a great honour by being here tonight. We are delighted that Madame Cho has come tonight in her beautiful national costume.

Yet another Korean connection is that, for only the second time, since we were invested together, during Her Majesty the Queen's Visit to Korea in 1999, with the Order of Diplomatic Service Medal, Sir Paul Newall and Sir John Morgan and I, have worn the regalia in public together. Apart from Her Majesty the Queen and His Royal Highness the Duke of Edinburgh the only other UK citizen to hold that honour is General Sir Anthony Farrar-Hockley, who, unfortunately is unable to be with us this evening. But at least the three Musketeers are together again!

I have had the pleasure of accompanying our Honorary Liveryman, His Royal Highness the Duke of Kent, on several trips to South Korea. He was to be with us this evening but sends his apologies as he is on route to Germany.

It is always a great pleasure to accompany His Royal Highness on an overseas trip. You get through the traffic, in Seoul or San Pablo, much quicker when you are with him, but I have also been on the receiving end of such a visit. When I was Managing Director of C.A. Parsons, in the North East, His Royal Highness came to visit our newly equipped massive machine shop. Of course there was a rehearsal the day before using the Lord Lieutenant as a stand-in. Walking around the plotted course it was obvious to me that, because of its positioning, His Highness would stop at a very impressive machine tool. So I warned the Operator that he would be talking to His Highness the next day. "Oh yesh" he said lisping slightly, because he had no teeth.

Sure enough, the next day, His Royal Highness stopped and talked with him for some time and he spoke beautifully in his Geordie accent, showing a large set of pure white teeth. After the visit I went back and said how glad I was that he had put in his teeth for the visit. "Oh" he said, "They are not mine, I borrowed them from a friend".

My Lord Mayor, you of all people are most aware of the efforts of our Armed Forces, and the engineering that supports them, through the Muckleburgh Military collection so lovingly preserved by yourself and your late Father.

It is well known you wanted to be an Engineer but for reasons of history went into the financial world where of course you have excelled. I won't dwell on the fact that I was once extolling the virtues of HSBC Bank, when you gently reminded me you were the Chairman of HSBC's Stockbroker Services. Rather I would like to suggest, instead of being Lord Mayor, how much more important you would have been had you become an Engineer.

For example, as an Engineer I was presented with a specially commissioned paper weight to celebrate the opening of the new, but sadly no longer existing Vickers Tank Works at Elswick in Newcastle upon Tyne on 24<sup>th</sup> November 1982 which I would like to present to you for your museum. I would also like to present you with a Centurion Tank. I'd love to say, that unknown to you, it is waiting outside and blocking all the traffic and surrounded by your city police. Alas, it is only a small model. Please accept these as my personal gift for your museum and also, on behalf of the Company, this cheque for your Scholarship Scheme.

There is another gift for you that is not gift wrapped. Your wonderful staff at the Mansion House are concerned that after your year in office, you will become bored! They have, therefore, commissioned me, at enormous expense, to give you a year of continuous professional development, the dreaded CPD, on how to become an engineer! Stand by for your first lesson soon!

The Junior Warden will welcome our guests and I don't wish to steal his thunder, but I particularly welcome all those Vice Chancellors, from the many Universities with which I have been associated.

My principle guest, Sir Paul Newall, is a great personal friend of mine, a necessary qualification

when you have to twist someone's arm for them to be your guest speaker. Sir Paul is a Banker but even more importantly he has dedicated much of his life in serving this great City, in many roles including that of being Lord Mayor. Again we have the Korean Connection in that he has visited Korea on many occasions to promote the financial expertise of the City of London particularly in his role as Chairman of the UK-Korea Forum. Paul and Penny, it is wonderful that you could be with us this evening.

So, may I end now by proposing the toast "The Lord Mayor, The Corporation of London and the Sheriffs."

"The Lord Mayor, The Corporation of London and the Sheriffs."

## **RESPONSE BY THE RT HON THE LORD MAYOR OF LONDON**

### **ALDERMAN MICHAEL SAVORY**

Master, Wardens, Your Excellency, My Lord, Sheriffs, Ladies and Gentlemen,

Thank you so much for the Civic Toast and for the cheque for the Mansion House Scholarship scheme. You are the 39th Livery Company to join this wonderful scheme which was only set up seven years ago to bring the brightest young financiers and regulators to study and work in London. It is a signal success and we are grateful to you.

But I forget my manners! Welcome to the Mansion House, George Dance's feat of architectural engineering. Tonight you have invited with the Lady Mayoress and me Alderman and Sheriff John Stuttard and Lesley and Sheriff Kevin Kearney and Mary. Our Duty Esquire this evening is Andrew McKie.

Master, may I join you in welcoming the Ambassador from the Republic of Korea as well? It was a considerable pleasure for the Lady Mayoress and me to dine with President Roe in the Guildhall last December.

Welcome too, to you Vice Chancellors. I was with one of your number recently who was pacing up and down in a rather distracted way, so I naturally asked him what was wrong. He thought for a second and



then said 'I was just wondering what I had done in a previous life to end up as a Vice Chancellor!'

Now Master, being a wannabe Engineer, albeit one with an honorary Doctor of Science degree, I very much enjoyed your remarks. But for me, as I suspect your distinguished academic guests, engineering is all about people. You have already alluded to those people who would deny others the benefits of engineering, but we celebrate those who are dedicated to enriching others lives through engineering. For example, the Chief Executive of GE was asked what was *the* key invention of the 19th Century. 'The light bulb' he answered. And what about the 21st Century? Without hesitation he replied 'combustion'.

Well, at City University I have seen the future of combustion in the form of ceramic engines which increase efficiency by some 40 percent. That means that instead of getting 40 mpg, you will achieve 120. Or shall I point to other aspects of automotive design and engineering? An astounding 80% of all worldwide automotive engineering takes place in the United Kingdom. And that means skilled people.

Now all these advances and so many more are undertaken by engineers of many nationalities and backgrounds who have chosen to live and work in the United Kingdom. Whilst I am not talking just about engineers, we estimated that London will need a continual annual influx of 100,000 skilled foreign workers a year for the next decade. Therefore, we in the City will continue to campaign for intelligent immigration rules for workers. We cannot support the current illogical chop-and-change visa restrictions for workers. For centuries immigration has been the lifeblood of the City and we must keep it flowing.

Indeed, I hope the Ambassador from Korea will not mind me astonishing you by revealing that no less than 10,000 Koreans live in and around Kingston-upon-Thames. All of them contributing to our prosperity in one way or another.

And we all know the loyalties that are formed when overseas students come to study in London, as they do in their thousands. These loyalties are priceless in later life. To that end we in the City cannot support the logic of punitive visa fees for students which force them to go to other countries. We cannot support the abolition of the right to appeal against visa refusals. Education has to be accessible. We must not repeat the woeful saga of HMS Manadon, the Royal Naval Engineering College, in our generation.

So like you, Master, that brings me back to the links between the City and Engineering. Our role in your success is to provide the infrastructure for British-based engineering.

The investment money, yes, but also promoting around the world what I call 'City-style contracts'. Contracts which are open and transparent, in English, under English Common Law and backed by speedy dispute resolution.

This is our contribution and one which I have been promoting on behalf of British-based engineering firms all around the world. If we can do what we do better please let us know.

Finally, Master, I see that you have recently been down to the Thames Barrier and I think you looked very fetching in your blue helmets. And I hope they talked to you about the defence of London against flooding. For us the critical year will be 2020, not long away, when the Thames barrier is scheduled to wear out. I urge you and the Engineering Council and your many fellow engineering councils to unite in petitioning government now to provide the money and plan for 2020. It is critical and crucial if we are to protect literally millions of people.

So Master, it is Engineering and People and your tremendous Company which does so much. I salute you all.

Thank you.

## **WARDEN'S LECTURE LUNCHEON THE HISTORY AND WORK OF RedR**

**18 NOVEMBER 2005**

At the request of some Liverymen the Warden's Lecture this year was given after a luncheon rather than after dinner. This resulted in a small increase in numbers attending and they were treated to an excellent lecture on RedR delivered by the Junior Warden, Tony Roche FREng who is also Vice President of RedR.

The luncheon was chaired by the Senior Warden, Commander Byran Gibson, in preparation for what may lie ahead. After a stimulating lecture which is published in full in the on-line Swordsman there was a lively discussion which finally ended at about 4:00pm.

The Company is a Patron of RedR and in addition to making grants for the Charitable Trust at least part of the collection at the Carol Service and the Election Court Service are passed onto RedR. The Company through its members has also been instrumental in assisting RedR to make contact with the 1851 Exhibition Trust and the Dulverton Trust. This has resulted in additional income to RedR of £65,000. This additional funding will be largely used to provide extended training to new and existing personnel, these people then passing on their knowledge to in-country relief and rescue workers. If any Liveryman could advise of other Trusts who make grants for education and training Tony Roche would be extremely grateful if you could pass the information on to him.

In support of the massive earthquake in South Asia last year RedR signed an agreement with the United Nations Refugee Agency to provide training and recruitment services in Pakistan. RedR-IHE is providing training for 80 camp management mobile teams, serving camps for 250,000 displaced people. Initially the focus was on international camp management standards, winterization, water and sanitation, sphere standards and community involvement. RedR-IHE will also contribute to the capacity building of NGOs, civil authorities and the military in terms of camp management and disaster preparedness.

One example of the work of RedR-IHE is cooperation with other agencies such as Water Aid is given by the

story of Gurimila Chakma who lives in Sapchari Jowthakhamar village in the Chittagong Hill Tracts, the

one hilly area of Bangladesh. Poor communities often have to walk up steep paths through the jungle to find clean water, or collect water from dug-out polluted sources or streams lower down closer to their villages. Gurimila tells of the benefits after WaterAid, and its partner Green Hill, helped provide safe, clean water for her community through a gravity-flow scheme.

"As we were so accustomed to waking up very early in the morning to fetch water from the distant water sources, when we had the new supply we still awoke in the moonlit night at about 1am or 2am expecting a crowd of people to be collecting water. We thought that the water would soon run out like it used to at the dug-out well. But after a few days we realised that there was plenty of water available the whole day and night - there was no need to queue, impatiently waiting at the tapstand. In a word, it was a miracle to us and our thanks are not enough for the amazing water supply.

Now, we have safe water in the village. The distance is so close that we can even leave the boiling rice pan on the cooker and return to the house after conveniently collecting water from the nearby tap. We only need a few minutes to fetch water. Now I have time for rest and can work more too. I just feel so much more relieved than before. I can help my husband more with the cultivation and gardening work and together we can now sow at least 30kg of paddy seed compared to only 10-12kg before. That's why our family income has significantly increased. We also don't fall sick as we used to. In the whole village water and sanitation related diseases have been significantly reduced and we feel much happier than before."

*Raymond Cousins*

**ANNUAL CAROL SERVICE**  
**14 December 2005**

The blustery wind parted the low clouds to reveal the moon, almost full. In the moonlight a dark, shadowy figure appeared in front of the Bloody Tower – “Just a few paragraphs for the Swordsman”. Yes, Past Master Cousins had struck again!



The 2005 Annual Carol Service was once again held in the Chapel Royal of St Peter ad Vincula, at the Tower of London, by kind permission of the Resident Governor. Conducted by the Chaplain of the Royal Chapel, the Reverend Paul Abram and our own Company Chaplain, the Reverend Michael West, the service was attended by nearly 200 Company members and their guests. The Chapel Choir, under Master of Music Colm Carey, opened the service with a superb rendition of the traditional carol “Once in Royal David’s City” giving us a preview of what was to come. In his opening address Reverend Abram included an informative history of the chapel and pointed out some of the interesting artefacts contained within the Chapel.

The service itself consisted of seven lessons, six carols and three pieces by the Choir on their own. The lessons followed the Christmas story but included “Jesus Birthday” by Peter Horsford, read by Middle Warden Rear Admiral David Bawtree, and “Thinking about Christmas” by Tony Windrush, read by the Master’s Lady Mrs Pamela Hawley. The congregation

proved to be in fine voice for their carols, which were interspersed with the opportunity to be able to sit in rapt silence as the Choir masterfully performed their selection of pieces. We are indeed very fortunate to be able to hold this important annual Company event in such surroundings and our thanks must go to the Resident Governor for his permission and to Reverend Abram and the Choir for their much appreciated participation.

On completion of the Service the Clerk, Air Vice-Marshal Graham Skinner, took charge of proceedings to explain the logistics for moving everyone to the Stationers’ Hall for dinner. With military precision he expertly divided the congregation into two halves and then lead the first party to waiting buses while the second party were given another opportunity to review the history of the Chapel with the Yeoman Verger. Having delivered the first party to the Stationers’ Hall the buses then returned for the second party. Who did better? The first half with more time to drink and talk or the second who were privileged to hear more of the remarkable history of the Tower and Chapel.



A little later than usual because of the travel arrangements we sat down to a sumptuous dinner with Australian wines generously provided by the Agent General for South Australia, Liveryman Maurice de Rohan. There we were able to thank Paul Abram, Colm Carey and the Choir and at the end the Master sent us on our way with his best wishes having enjoyed an excellent start to the Christmas festivities.

*Paul Cariss*



## ELECTION COURT

28 FEBRUARY 2006

The new arrangements for the Election Court that was held on 28th February, where there is first the Court Meeting, then an investiture of new Liverymen and the Election Court Service followed by a reception and dinner, are working well.



*Master, Robert Hawley with the New Liverymen*

Many members of the Company attended the Investiture to welcome the new Liverymen and then proceed to Church to ask for blessing upon the new Master and Wardens.



*The Clerk, Graham Skinner, announcing the Results of the Elections*

This year the service was held at the Church of St Verdast-Alias-Foster, very close to the Hall in

Foster Lane. The Church is a delightful surprise almost hidden in a row of shops.

At the Dinner the Clerk announced that at the Election Court, Commander Bryan Gibson, MBE, formerly Clerk to the Company was elected to serve as Master from 25th April 2006. Rear Admiral David Bawtree, CB, was elected Senior Warden, Tony Roche FREng was elected Middle Warden and Chris Price FREng, was elected Junior Warden. In accepting the office of Junior Warden, Chris Price referred to the similarity to entering Noah's ark with two former Presidents of the Institution of Mechanical Engineers following two Naval Officers into office.

After dinner the Master Elect and Wardens elect each drank a loving cup with the Master. The new Master Elect addressed the Company saying:

"Master, Fellow Wardens, Liverymen

Earlier this evening I thanked the Court for the honour and privilege of being elected as your 23rd Master and I now thank you all for the warmth of your reception.

When I was appointed Secretary and Chief Executive of the then Institution of Metallurgists in 1982, I achieved a long held ambition and I felt my life was pretty well planned for the next 20 years. Very quickly I discovered that my senior officers, together with senior officers of the other mining and metallurgical institutions, had been for some time, discussing the formation of a livery company. Indeed, at the first Council Dinner I organised in Pewterers' Hall in July 1983 the principal guest was Alderman Sir Peter Gadsden who announced that six days earlier the Company of Engineers had been formed and it was two days later that the Petition for the Grant of our Livery was lodged with the Court of Alderman.

So it was that I became involved with this Company from its inception and in many ways it seemed I then lost control of my future. When in the mid-1990s it was clear that I couldn't, because of their conflicting demands, continue to serve both the Institute of Materials and the Company, it was the Company that won. 24 years ago I set off on a journey with no idea of where I was heading or what would happen en-



route. I can only say I has been fascinating, rewarding and a privilege.



*Commander Bryan Gibson MBE  
Master Elect*

I know only too well the demands made on Masters of this Company and equally I know the enormous contributions made by each of my 22 predecessors. Our progress over the last 23 years has been phenomenal and each Master has played a significant part. Pamela and Bob have dedicated themselves during the last year to the Company and the contributions which Bob has secured for the Charitable Trust Fund through the new Hawley Award represent the largest annual influx of funds to the Trust since it was established 22 years ago. As Clerk, the most usual comment I heard from every Master on election was "How do I follow that" and believe me I feel exactly that this evening.

I can, however, assure you that Mary and I are fully committed to the coming year which we are looking forward to enormously. We have already established a programme around my theme of "Engineers and the City" which I hope you will find of interest. We are also gratified by the numbers who have already booked the September Out-of-Town meeting in Falmouth. Our Founder Master, Sir Peter, has always said that the Livery must be fun and I hope we are all going to enjoy ourselves in the year ahead.

Thank you."



*Chris Price on being invested  
as Junior Warden Elect*

The evening concluded with each of the seven new Liverymen (a record since the early days when special meetings were held solely for the investiture of new Liverymen) telling us a little of their career and demonstrating on how well they will be able to maintain the high standards of the Company.

We now look forward to the Installation of the new Master and Wardens on April 25th and to another exciting and busy year.

*Raymond Cousins*

## **CHELSEA TO CAIRO**

### **Taylor-made Water through Eleven Reigns and in Six Continents**

Liveryman Gwilym Roberts has written a history of his former firm of water engineering consultants, John Taylor and Sons and their predecessors. It describes many projects over nearly 300 years. Along with the Aswan Dam, Sydney Harbour Bridge and Opera House, the Cairo project has been named as one of the UK's principal international engineering projects of the twentieth century. A copy of this recently published book is available to borrow by collection from the Company Office.

## Personalia

*Welcome to New Liverymen invested on 11 October 2005*



*Professor John Keith  
COLDWELL FIEE, FRAeS*



*Michael Kenneth ROLLS  
FI MechE*

*Welcome to New Liverymen invested on 10 January 2006*



*Professor Graham James  
DAVIES FREng, FIEE*



*William EDGAR  
CBE FREng FIMechE*



*Professor Simon WATTS  
MBE, PhD, FREng, FIEE*



*Donald Anthony YOUNG  
FIGasE*



*Peter Edward HARRIS  
FIMechE*

*Welcome to new Liverymen invested on 28 February 2006*



*Professor John UFF, CBE  
FREng, FICE, QC*



*Nicholas John BURRASTON OBE  
FIMechE*



*David John HUGHES  
FR Eng FIMechE*



*Professor Stephen James  
NIGHTINGALE PhD, FIEE*



*Dr John MORTON  
FIMMM*



*Professor William O'RIORDAN  
FREng PhD, FBCS*



*Dr Michael Gilbert James William  
HOWSE OBE  
FREng FIMechE*

We regret to record the deaths in December 2005 of Daniel Lampert, aged 92, and David Train, aged 86, both of whom joined the Company in 1984.

With the new Liverymen invested on 28 February 2006 there are now 302 Liverymen, the highest number the Company has ever had.