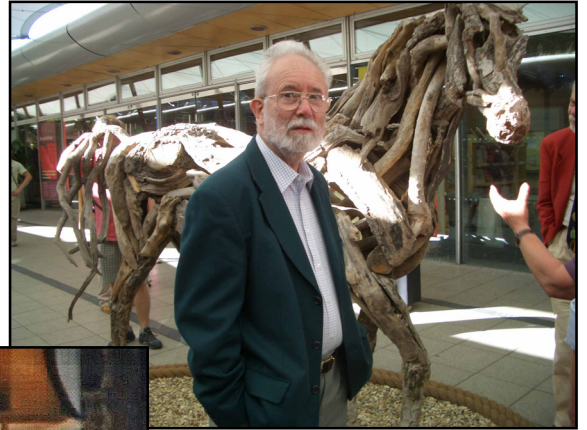


# The Worshipful Company of Engineers

(Incorporated by Royal Charter 2004)

## The Swordsman Newsletter



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Top Left	The Eden Project Biomes
Top Right	The Master at the Eden Project
Centre	Sir Peter Gadsden – The Founder Master
Bottom Left	Falmouth Harbour from the National Maritime Museum
Bottom Right	Plant Statue at The Lost Gardens of Heligan

**PROGRAMME OF EVENTS**

United Guilds Service – St Pauls	23 March 2007
Visit to Painshill Gardens	17 April 2007
Installation Court and Common Hall – Plaisterers' Hall	24 April 2007
Warden's Lecture and Lunch – Wax Chandlers' Hall	8 June 2007
Election of Sheriffs – Guildhall	25 June 2007
Awards Livery Dinner – Ironmongers' Hall	10 July 2007
Golf Day – Clandon Regis	27 July 2007
Out of Town Visit to Portsmouth	13-16 September 2007
Election of Lord Mayor – Guildhall	1 October 2007
Ladies Luncheon – Wax Chandlers' Hall	3 October 2007
Annual Banquet – Mansion House	26 October 2007
Lord Mayor's Procession	10 November 2007
Carol Service – Tower of London and Dinner on the River	11 December 2007

## EDITORIAL

Welcome to the 17th Edition of the Swordsman which is my 5th. Doesn't time pass quickly when you are having fun! The life of the Engineers' Company gets busier and busier each year and it has been a great delight to see our distinguished former Clerk lead us in an excellent year Master. This edition includes stories about our visit to Cornwall as well as the traditional functions held in the City.

Once again many thanks to all the Liverymen and wives who have responded so willingly to my call for reporters. I cannot manage without you.

I owe much to Past Master, David Mitchell, for his guidance and examples in producing the Swordsman. When I took over from him as editor he continued to act as the Webmaster publishing the on-line Swordsman as I was able to provide him with details of each event. David has now decided that enough is enough and has handed over the role of Webmaster to Court Assistant, Clive Walker.

Many thanks David for all your hard work on the Swordsman and the Web and I now look forward to working with Clive.

I hope you enjoy this edition and do not forget to let me have your views and ideas for future editions.

*Raymond Cousins*

## THE CLERK'S CORNER

In my previous Clerk's Corner in July last year I discussed the internal refurbishment of Wax Chandlers' Hall and said that it would be finished by Christmas. It was planned that the Lord Mayor would be re-opening it officially in the New Year. Now, as Stephen and I shout to each other over the sound of drilling and peer through the clouds of dust, I have to tell you that the present estimate for completion is sometime in the first weeks of May. You will be pleased to know that we are not being charged rent or services for the Engineers' Office in this period but it has been a trial to operate here. This has also caused us to change the dates and venues of various functions with consequent increased hire and catering costs. You will see some photographs of the fundamental work involved and the ensuing interim chaos here. In the end I am fairly confident that the refurbished Hall will be a major improvement both cosmetically and in the spaciousness of the reception areas on the ground floor with a larger lift to transport visitors up to the Hall.

In the meantime, we have had to cope with this 100% overrun of the Hall refurbishment and I hope that our service to the Livery from the Office has not been diminished. Fortunately, we have a system to access our computers from off-site during those periods when it has been impossible to remain here. Notwithstanding the work in the Hall, this too has presented some challenges anyway in the recent

period. For example, whilst I may have discussed previously the plans to move to 'paperless'



*The enlarged lift*

communication with members, neither I nor the Beadle are entirely comfortable about communicating effectively through this medium for important calling notices, agendas etc for the Company even though 75% of our membership are on e-mail. We also have a problem with 'spam' filtering making office e-mail activity tedious and in

these circumstances we are using only the Beadle's computer for all 'send/receive' activity in the office – members should note that whilst 'Steve.Grundy@btconnect.com' may appear in their 'from whom' sent box, these e-mails could be from either The Clerk or from The Beadle and it is necessary to look at the signature box to be sure who has sent the e-mail. Thus it's not just Stephen who appears to be working out of the office! However, we are still developing how to best to reduce our paper output most effectively and, for example, I will be introducing some booking proforma to be available on the web-site in due course.



*The Gentlemen's Toilet*

Finally, I will look forward to greeting you in our refurbished Hall together with my new Assistant, Mr Stephen Grundy, who now has the official Company title 'The Assistant Clerk and Beadle' to more properly reflect his increasing responsibilities and the balance of work between us. Details of this appointment and the conferment of Honorary Freedom on Stephen in recognition of his 20 years loyal service to the Company is reported separately – but, of course, my congratulations go to him too and my thanks for all his support to me personally over the last 4 years.

*Graham Skinner*

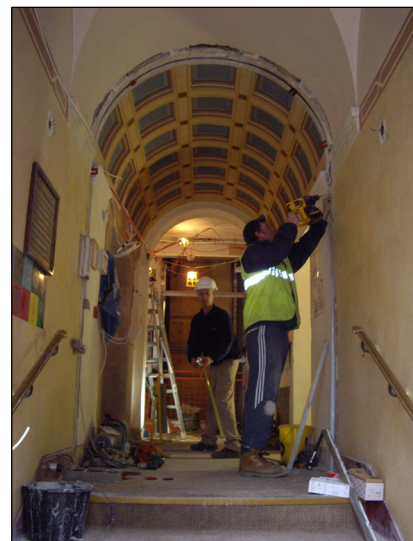
Photographs taken on 9th March 2007 showing the progress of the work!



*Work in the Dining Hall*



*Past Master Willmot's door to the Engineers Office duly protected*



*The Main Entrance*

## VISIT TO CORNWALL

14th September to 17th September 2006



The Master, Bryan Gibson's Out of Town Meeting this year was to Falmouth in South West Cornwall. Despite some torrential downpours on the way we arrived at the impressive Falmouth Hotel in glorious sunshine which was to remain with us for the next two and a half days (just look at some of the pictures).

The Falmouth Hotel, which was built in 1863, is on the narrowest part of the isthmus between the mainland and Pendennis Point. It has splendid views at the front looking over the sea to the south and at the rear looking over the thriving port with traditional fishing craft next to luxurious yachts, cruise ships and navel vessels (oops the hotel's mistake – naval!) (I expect there are some of mine elsewhere).

*The Falmouth Hotel – Gathering for the first visit.*

The Master and Mary with the Clerk and Margaret welcomed us with packs of leaflets on the area and a gift of the 2007 'Falmouth Calendar' to remind us throughout next year of a very happy visit.

After checking into comfortable rooms the buzz of excitement over afternoon tea as Liverymen greeted each other was almost tangible.

Later that evening we enjoyed an excellent dinner in the Pendennis Room at the hotel followed by the usual briefing by the Clerk, Graham Skinner. Following his instructions to the letter we were on parade at 09:00 the following morning to start the visits and tours. My thanks to the various reporters for their excellent descriptions of the particular events which follow.

After three days of Engineering, historical and botanical visits Liverymen began to take their leave after breakfast on Sunday, others did so after the service at Truro Cathedral whilst the hardy stayed on to visit the Lost Gardens of Heligan and yet another dinner at the hotel.

The Out of Town Meetings are undoubtedly the occasions when Liverymen and their guests are able to meet informally and get to know each other better. The meeting should be a must for every Liveryman who wishes to make the most of their membership of this prestigious Company.



*The Master and Mary relaxing at Eden*

*Raymond Cousins*

**VISIT TO TREMOUGH CAMPUS  
COMBINED UNIVERSITIES IN CORNWALL  
14 September 2006**

At the visit to Tremough Campus we first heard about the developments at the Campus from the Provost, Professor Keith Atkinson. After this we were divided into two groups for the Creative or Technical Tour which are described below. The report on the “Creative Tour” is a double act between Beryl Prichard and Andrew McNaughton, reflecting their particular interests. Whilst some areas were off-limits due to the usual all-pervading “elf’n’safety”, we still got a fair view of the breadth of activity on offer. Ladies first:



*Tremough Campus Hub Building*

**The Creative Visit**

My interest on the Creative Visit to the Tremough site of the Combined Universities in Cornwall focused on the practical subjects offered and, especially, the field of textiles and textile design. It was disappointing that we were unable to see any work in progress as the students had not arrived for the Autumn Term—however, we were able to appreciate the considerable facilities available to them: the spacious and well-equipped studios with, not only the traditional tools such as printing tables and specially imported Dutch weaving looms, but also the latest technical equipment matching any College in the United Kingdom. Equipment such as the digital printing suite, a precision laser cutter, a large computer controlled Jacquard Loom and a rare 3D Digital Research Cluster—the latter being of particular benefit to ceramicist designers, inspiring them to push the boundaries of

design. The few examples of work that were displayed in the studios provided evidence of the advances in design possible with the modern equipment.

Like many of my generation, I do not always appreciate the finer points of the use of the computer. This engenders a feeling that the hands-on individuality of craft skills may disappear altogether and be usurped by totally computerised products, though I hasten to add that this is not on the agenda at Tremough. It is clear that the objective is to achieve work of exceptional quality using traditional and man-made products through the use of technology. Dr Kate Burrell, the leader of the 3D Digital Research Cluster, confirmed this: ‘It is not about replacing craft skills

with computing, it's about bringing all the skills and traditions that we have in making, combining them with new technologies, and seeing how they might interweave and enhance each other'.

It was interesting to discover that the South West has the largest percentage of designer makers in the UK outside London. This, along with inspired thinking from a University College Falmouth lecturer, led *Hidden Art*, the internationally-renowned designer-maker support agency in London, to launch its first ever regional franchise in Cornwall. This provides an additional advantage for Tremough, a direct, important link to the real world. *Hidden Art* is based on campus, which means that they can work really closely with graduates to make sure that as many doors as possible open for them in Cornwall—one of the key objectives of CUC being to increase the number of young people staying in the county.

*Beryl Prichard*

Cornwall is, of course, famous for its gardens so it was no surprise that one of the creative arts subjects should be Garden Design. One of the course lecturers, Sandra Zivkovic described the work of the department which had just seen its first 10 students graduate with BAs. Sandra had come to Cornwall from Munich, excited by the opportunity to set up the course from scratch using all-new equipment, and by the connections with the leading gardens of the area which complemented its work through providing practical horticultural experience. One could but envy a generation which not only worked with conventional media such as drawing and scale models but which could create designs on computer and use the latest software to watch instant virtual pictures of their designs flowering through a virtual year!

Although, as elsewhere, there was the emptiness which anticipated the new academic year, some scale models were left over to view briefly. What came across most though was Sandra's enthusiasm and the plans to build up to 30 students a year – becoming a leader in garden design in Europe.

Our host for a peek behind the scenes of the Media Centre was Alan Barnes whose pride in what had been achieved in the last 6 years flooded out of his every comment. The facilities included a main television recording studio, producers' and editors' suites. We were able to see how some of the tricks of the trade

were used to create the illusions of the weather forecasting slot or Peter Snow's election night antics.

We also received a teach-in on how autocues worked with one or two anecdotes about what could happen if the presenters upset the production staff!

The *raison d'être* of the Centre was the BA in Broadcast Journalism course which now attracted students from far and wide and had become "the" place to go for hopefuls from London following in the footsteps of an already impressive list of household names. A key to the Centre's success was funding to purchase the latest sound and digital film equipment as used by the national radio and television companies. Alongside this was a popular module on scriptwriting. Alan emphasised that the facilities were available for all students on the campus to use, not just those on these specific courses; the video recording equipment was now supporting modules in a number of degree and further education programmes.

All in all, a huge amount was packed into little over an hour and we were indebted to the people from the Combined Universities for whisking us round with such evident enthusiasm.

*Andrew McNaughton*

### **The Technical Visit**

Around forty-five members, including a few non-engineers, set off on the Technical Site Tour of the CUC Campus at Tremough, not realising just how much would be covered in such a short time. Each of the five sections that were visited demonstrated the important links to business and industry as well as the related research and the efforts to produce well-qualified graduates. Indeed, July this year saw the first ever UK graduates in Renewable Energy; eight students completed the course at the Cornwall Campus, with several of them staying in the area and helping to overcome the local skills shortage. A good example of cooperation with business is Redruth company which, with CUC, has developed a foam resin made from castor oil; this will replace most of the polyurethane resin used in the manufacture of surfboards.

In the Renewable Energy Department, Dean Millar described the wide-ranging research which includes using advanced wave modelling software to establish the proportion of wave energy that can be 'cropped'

safely without worrying shoreline users, including seals and the surfing community. The latter complaining most vociferously, even though the actual generator will be 11 or 12 miles off-shore! Sea trials are being conducted to determine the performance of marine engines of fishing vessels using renewable fuels such as bio-diesel produced from chip fat and tallow at around 19 pence/litre. This fuel has been successfully used to operate a commercial jet engine. There was a level subdued scepticism in the group as to whether these measures could really meet future energy demands.

In the laboratory, two PhD students demonstrated their research projects. Gareth Kennedy was working on detector system with the mine safety authority (on a DTI grant) which would help locate an individual or a group following a disaster. James Purser had made a remote controlled robot on to which could be mounted various pieces of equipment (a camera, a surveying instrument, gas detector etc. etc.) to investigate mine workings and avoid risk to employees. His research had taught him a valuable lesson—the need to use engineering techniques and skills that are outside his own discipline—something that is usually learned later, ‘on the job’.

In the department of Geography, Archaeology and Earth Sciences there was a demonstration of the latest equipment and techniques of surveying. Using a specially developed Leica “camera” with a strobe laser beam, it is possible to survey any physical feature—a



*In the QUEM Scan Laboratory*

valley, a mine or whatever. The group were shown various surveys that had been made, including a local

monument, which was viewed on the computer monitor from every possible angle—even inside.

Environmental Materials Characterisation is the deceptive title of a captivating department which brought forth the most questions—and the comment from one of the demonstrators: ‘Such an interested group, but so little time!!!’. QUEMSCAN is the flagship instrument of the Camborne School of Mines. It is a highly sophisticated computer controlled electron scanning microscope which analyses soil, dust, minerals and other inorganic samples with unprecedented speed and accuracy. It was originally developed for the mineral processing sector to determine minerals present in an ore, the textural make-up, the ease of liberation of the main constituent, and so on. Subsequently it has found use in: forensic science, finger-printing soils, allowing an evidential link to be made between a suspect and a crime scene; environmental monitoring, characterising airborne particulates; investigating inorganic components in contaminated land—the list goes on and on. A similar state of the art machine—with the exotic name electron-probe micro-analyser—is used for the characterisation of materials at the micron scale, from a few mg/kg to 100%. Two interesting examples of its use were given. First, an archaeological dig had unearthed an arrow head and requested CUC to ‘confirm its bronze age provenance’—unfortunately the archaeologist would be disappointed—it turned out to be mediaeval! Second, in Egyptology, analysis of the eye make-up of mummies was shown to contain an exceptionally high level of lead compounds—remarkably, and worryingly, similar cosmetics are still on sale in the Cairo souks.

Finally, a visit to the purpose built laboratory to see a machine for mineral screening, classification and separation. The system can be adapted to separate materials based on density, conductivity, magnetic susceptibility, and surface properties (such as colour) or appearance in visible or NIR light. A most interesting example of its use was given. A ton of material was sent from Greenland to find a method of extracting rubies. Using the exceptional machinery, 50 kgs of high grade rubies were produced. The department charged, what appeared to be, a princely sum of £20,000 to carry out the work—it was realised only later that this was a significant undercharge; the rubies, when cut, were worth £4.5 million!! Perhaps the saddest aspect of this story is that the rubies were sent



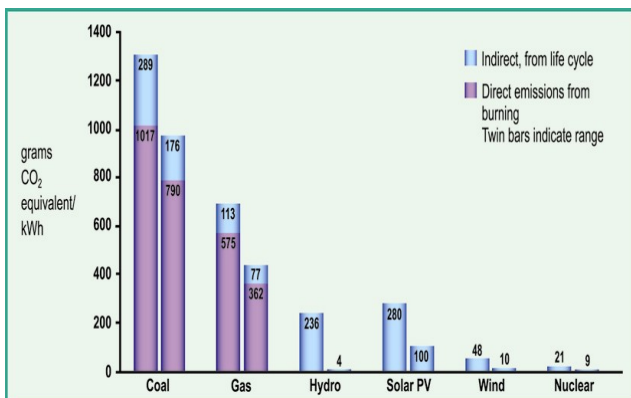
to Indonesia; there the workers are exploited with incredibly low pay for their skilled expertise in cutting the rubies.

At the end of the tour, I was left with some significant impressions. First, the quality of the equipment which had been installed in the various departments and, especially, the sophisticated software being used.

Second, and perhaps more importantly, the exceptional level of enthusiasm of everybody with whom we came in contact – from the Cornwall Provost down to the research students. If the lecturers achieve the same level of enthusiasm when teaching, then the students at CUC are very fortunate.

Don Prichard

During our Out of Town meeting we visited the Department of Renewable Energy at the Combined Universities of Cornwall. The research topics there covered many aspects of renewable energy, for example windmills, bio-fuels, and heat pumps.



During a lively discussion with the Head of Department he stated that he taught that amongst the disadvantages of nuclear generation were the uncompetitive costs and that when the mining of uranium was taken into account the production of CO<sub>2</sub> from nuclear was far higher than from any other sources of electrical production.

To put the record straight the Company may wish to visit The Royal Academy of Engineering web site for a detailed review of cost and note the above chart from the IAEA showing carbon emissions.

It is of interest that the use of nuclear in the OECD reduces CO<sub>2</sub> emissions by a far greater amount than

the Kyoto targets and that the total energy input in the full life cycle of a nuclear power station from mining the Uranium to storing the waste is 1.35% of its life time energy output.

Robert Hawley

### VISIT TO NATIONAL MARITIME MUSEUM - CORNWALL

15 September 2006

If Falmouth had nothing else to offer other than the National Maritime Museum Cornwall, and it has plenty, it would be worth making the journey. Looking like a boat yard and lighthouse, it fits perfectly into the waterfront. It contains, and is building on, the library of John Bartlett and is part



Approaching the Maritime Museum

of the Maritime Libraries Group. This enables it to fulfil a specialist information source for the Merchant Navy and small boats especially those with a Cornish connection. Under its director, John Griffin, it is entirely staffed, amazingly, by enthusiastic volunteers. and its contents are readily available to interested members of the public.

In the main body of the museum every aspect of boats and boating seem to be covered. It is far from being a collection of ancient artefacts. Boat restoration is actually taking place within the building. At the moment they are working on a vessel that took part in the 1952 Olympics alongside the Daisy Bell, a fishing boat dating from 1890 which has been in the same

family since then. When asked if they are still collecting material the answer was, “ If it floats we are interested”!

There are boats everywhere and of every type starting with a reconstruction of a dug out log and its development. People who love boats will find examples that will entrance them, both full sized and in model form. Those who, like me, regard unnecessary sea borne travel as the greatest foolishness will have their worst fears confirmed. The fearful tales of such as Tony Bullimore who survived five days in a capsized boat or the Robertson family, adrift for five and a half weeks in

1971 are vividly displayed. The heroic successes of Ellen MacArthur and Robin Knox Johnson do nothing to convince me it would be worth a try.

There is much to fascinate. In these days of GPS it is chilling to remember that before radio news of ships was communicated by “speaking”. Two passing ships would report news to each other and on arrival in London the messages would be published in the Lloyds List.



*The Master safely 'afloat' in a life raft*

A section on the “James Caird” the tiny boat in which Shackleton set sail against huge odds to organise rescue for the twenty-seven men left on the ice of the Antarctic is enthralling. His Burberry clothing is there and also the banjo saved from the sinking “Endeavour” on Shackleton’s express orders with his words “It is vital mental medicine, and we shall need it”.

There are many interactive displays but my favourite was a large, table height boating pond on which radio

controlled boats may be sailed in artificial breezes and tides.

Another room contains the history of the packet ships with their routine sailings making the sending of what we would call “post” much more reliable. Just off the shop there is a huge screening of what it feels like to be at sea in wild weather which did nothing to change my mind.

Personally I was happier in the viewing tower overlooking the whole of the harbour or in the well stocked café which also has a lovely outlook over the estuary.



*The Junior Warden, Chris Price, showing off his sailing prowess*

George Hogg, the curator, is justifiably proud of this whole enterprise and even of its first failure, the underwater viewing room which has since been put right. To begin with all that could be seen through the glass was murky water and general detritus rising and falling with the tide. Then someone had the brilliant idea of dropping crumbs into it and immediately shoals of mullet appeared to entertain, completing a tour from top to bottom of the world of the sea.

*Anne Bawtree*

## VISIT AND DINNER AT PENDENNIS CASTLE 15 September 2006

Pendennis” – ironic really that Raymond should ask Ted and me to cover the visit to Pendennis Castle. For most of my childhood I lived in a house in Cambridge named “Pendennis”; however, that was not one nearly as old or as fascinating as the real thing we visited on the Friday evening of our weekend in Cornwall.

Arriving by minibus, we went through the narrowest of archways – phew.... that was a close shave! Graham had warned us that we had to go through “the eye of a needle”– and it was! At the circular Keep in gloriously warm sunshine, we were immediately greeted by smiling hostesses with a very welcome glass of champagne, before being received by the Master and Mary in a circular reception room with seven lookout windows all attractively candlelit.



*The Tudor Gun Deck Tableau*

Having assessed our surroundings we sauntered off to tour the Governor’s Quarters and then up onto the Tudor gun deck – where there was a very noisy and smoky rendition of a defence of The Castle. Cannons boomed, men shouted and billowing smoke obscured the “cracking view” over Carrick Roads leading up to Truro. The hexagonal nature of the building with windows in each wall meant that an all round watch could be maintained with ‘all mod cons’ included – although one rather hoped that the evil looking concoction in the cooking pot wasn’t an indication of dinner to come!!

Up the stone circular staircase we continued to the upper deck and open air walkway. Wow! What spectacular views!! Over the Roads we could see the sister Tudor castle of St Mawes and all along the East coast, while to the South stretched further huge vistas out to the English Channel.

Higher still, with wonderful weather and the blue of the sea the scenery was further enlivened by the RNLI Lifeboat going out to sea at high speed – an exercise we hoped – and (so I was told by those that know) a race of gaff-rigged cutters, and some other types of impressive looking yachts, sailing gracefully up the Fal River estuary. [*Brian, you didn’t have to go to those lengths for our entertainment!!*].

Closer at hand, we noted the series of defensive works constructed under the direction of the Military Engineer Paul Ivy in 1598; these withstood five months of siege in 1645 before the castle became the penultimate Royalist garrison on the British mainland to surrender (they were down to one pickled horse – thankfully we were not to suffer that fate!)

61 steps took us from the top enclosed lookout deck to kitchens down in the dungeons. There were kitchens designed to cater for 10 on a regular basis but for as many as 100 in an emergency: with fireplace and ovens – and loo off! What a feast the current Health and Safety staff would make of it all!

And then - a romantic moment in the setting sun as we made our way across the Green to the Royal Artillery Officers’ Mess. We were reminded, by the various anti-aircraft and other guns emplaced there, that the Castle saw significant action in World War Two and was not de-commissioned until 1956.



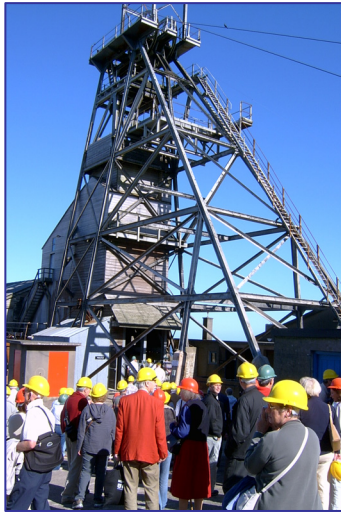
*Walking from the Reception in the Keep to the Officers' Mess for Dinner*

After a perceptive and thought-provoking grace by Past Master Richard Rooley, we enjoyed a superb dinner accompanied by delicious Cornish wines and finishing with a selection of equally delicious Cornish cheeses. Thank you Master for a truly memorable evening and, as it turned out, a very promising portent of things to come.

*Sally Willmott*

**VISIT TO GEEVOR TIN MINE  
16 September 2006**

The party visited Geevor Tin Mine, now a Heritage Site in the morning of 16th September.



*The Headgear Tower*

On arrival at the mine, the party were met by Mike Simpson, Mine Manager, and Bill Larkin, a Trustee.

Following a briefing, the party toured the Compressor House, (compressed air was used to drive much of the machinery under-ground) the Headgear of the Victory Shaft and Winder House, the Miners' Changing Rooms, the Mill (designed to recover a product with a higher percentage of tin) where a shaking table was the *only* piece of machinery actually working during the visit. The visit ended with a short underground tour and a visit to the shop.



*Waiting to go underground*

Tin mining used to be one of the main activities in Cornwall and has shaped its development and landscape.



*Typical Plant at the Mine*

Cornish miners returning from the Boer War in 1911 formed Geevor Tin Mines Ltd and by the 1970s the mine occupied an underground working area of 3 sq. miles but because of the fall in the price of tin the mine closed in 1990.



*The Master, Mike Simpson Mine Manager, and Founder Master, Sir Peter Gadsden*

For the Founder Master it was a 'return' visit as he paid an official visit to the mine as Lord Mayor in 1980.

*Peter Gadsden*

## VISIT TO THE EDEN PROJECT 16 September 2006



*The Biomes*

The aim of the project is education and a demonstration of the effect of plant sustainability, demonstrating the plants which have changed our lives.

Among the comments by Liverymen:

So glad I came  
Guide was just wonderful  
Pace was just right  
Just wonderful  
Master gardening on an industrial scale

The coach brought us past the remains of gypsum mining, the heaps, the quarries, the remnants of an industry now closed down. In a large disused quarry the domes and gardens of the Eden project nestled as a hidden jewel. Most of us had heard of the ecological gems of the tropical dome, the temperate dome and the outside gardens known as biomes.



*An attentive group in the Temperate Area*

With time pressures we divided into groups, some to the tropical, hot, wet and luxuriant areas which were unknown to most. Others toured the temperate which are closer to the current UK conditions and

which will become more so with global warming. The guides were all very knowledgeable with funds



*The New Education Building with its roof based on the Fibonacci Sequence*

of anecdotes which enlivened the tours. All found they wished they had time for more and were determined to return.

On a warm evening on the terrace the Marketing Director, Mr Dave Mineer, spoke with passion of the history and plans for the site. We learned of the £50M grant from the Lottery Fund towards the total spend of £135M; the 35,000 visitors on a busy day and perhaps 3,000 on a quiet day; the 500 peak staff falling to 350 in the winter. The plans for development, not as a theme park but true exposition of nature at work and in balance which is exciting to children and adults of all ages.



*The Master thanking David Mineer for his hospitality and talk*

An excellent dinner with comment and thanks by the Master brought to an end the excellent day.

*Richard and Ruth Rowley*

## SERVICE IN TRURO CATHEDRAL

**Sunday 17 September 2006**



*Truro Cathedral*

We approached Truro Cathedral with the sound of the bells ringing out, always a welcome to a Cathedral or Church. It suddenly came into view amongst shops and buildings as if it was growing out into the surroundings with no grand gardens separating it out from everyday life. The Victorian Cathedral was built of Cornish Granite in the Gothic style and was the first Cathedral to be built on a new site since Salisbury in 1220. The tight space in which it was built was previously occupied by the fifteenth century parish church of St Mary. It is particularly interesting in that it incorporates the nave of that church as a chapel, albeit with some tricky architectural adjustment making a church within a church.

Forty or so liverymen and guests attended the Sung Eucharist, which was presided over by the Precentor, Canon Perran Gay, who, in his opening words, gave welcome to the Worshipful Company of Engineers.

The choir of Truro Cathedral sang the Introit *Sicut cervus* (Palestrina) and it was clear this was a very good choir. It is regarded as being one of the top six

cathedral choirs in the country. They sang Byrd's Mass for four voices during the service and the anthem *Ave verum corpus* (Byrd) all beautifully balanced with the fresh sound of the boy choristers. The Father Willis organ is famous for its sound and quality and attracts recitalists from all over the world. It was installed in the Cathedral in 1887 and is still in its original tonal state.

Canon Geoffrey Pengelly, Stall of St Germanus, Vicar of Egloskerry, North Petherwin, Tremaine & Tresmere, developed his sermon following the reading in the service from the Gospel according to St Mark, Chapter 8, verses 1-12. '...and Christ said "who do you think I am?" Peter replied "Christ"...' The result was a gentle, but thoughtful and persuasive argument that in an age when there is much emphasis on accountability, but which so often can mean passing on the blame to others, each of us is accountable to a higher authority.

The Voluntary – Toccata in C BWV 564 by JS Bach was played by the organist and demonstrated the richness and depth of the instrument.

*Keith and Valerie Foster*



*Truro Cathedral*

## THE LOST GARDENS OF HELIGAN

### 17 September 2006

I must say that before our visit to Cornwall on the Master's Special Event I had never heard of Tim Smit – but this sorry gap in my knowledge has now been well filled!



The gardens of Heligan House were dynamically constructed over a period of 150 years for the challenging and socially competitive requirements of the successive Squires Tremayne who used to reside in Heligan house. Heligan's watershed was the period of the Great War – at the start of which Heligan employed 22 gardeners and of these only 4 returned, and those that returned were unable to work on the estate.

The Tremaynes offered Heligan house as a convalescent hospital for shell shocked officers and subsequently tenanted out the property. The house and particularly the gardens fell gradually into a state of dilapidation, swamped by overgrowth and hundreds of laurel trees that grew to great heights. The lawns completely disappeared. In 1970 the house was detached from the gardens for reasons of death duties, and today the house is privately owned and not open to the public.

In 1970, Tim Smit, a Dutchman of enormous drive, vision and foresight [and not to mention a little money], along with a colleague John Nelson, persuaded the then owner of the "gardens", John Willis, to let him restore the gardens. They set about this mammoth task with huge energy and enthusiasm, resolving to restore the gardens as a tribute, not to the lords and ladies of the past eras, but to the working people who had interpreted their grand plans. Indeed, Smit visited the families of the departed and injured gardeners to ensure the project was as authentic as possible.

Our guide was absolutely excellent. She was imbued with the spirit of conservation, and was clearly walking in the footsteps of Smit. The conducted tour encompassed only a small part of the whole, but included the Northern Gardens – Flora's Garden, the Vegetable Garden, the Melon Yard, and the Flower Gardens.

In **Flora's Garden** we were told that the super springy turf had been planted in composted soil but with an added component – granulated rubber from tyres off old vehicles, which added to the water retention properties. The **Vegetable Garden** was a delight – two acres of beautiful soil, very few weeds, proper crop rotation, and double dug by *hand spades* once a year. The **Melon Garden** had been lovingly restored and nearby we found the **Pineapple Pit**. This consisted of two great trenches filled with 15 tons of fresh manure [the guide book says horse manure!]. The rotting manure gave off sufficient heat to raise the temperature in the chambers. No wonder the pineapples were of great value – usually being used for table decoration, and only the very privileged were allowed to sample the real thing. The lad who lived in the garden shed had to turn the manure at regular intervals, starting at 6am. Were these the most expensive pineapples ever grown? The **Tool Shed** was also of great interest particularly to the gardeners on the tour. This housed many of the gardening tools used at the time – the quality and design in some cases bettering the tools currently available today. The **Thunderbox Room** brought back memories of service time! The pencil graffiti on the walls showed some of the marks made pre 1914 – a veritable time warp. The **Bee Boles** had been successfully brought back into use by Smit and his team, but were closed on the advice of the Health and safety Executive – such is the price of "progress". Pollination in the nearby fruit garden has naturally suffered. Finally, the **Flower Gardens** brought the guided tour to a close. A riot of colour and variety, these were the ultimate tributes to the conservators.

It is impossible in a few words to describe the whole ethos behind the Heligan enterprise, and certainly it is a "must" for anyone with horticultural and conservational leanings. As gardens they have much to offer, and I am sure that most of the participants of the tour [and hopefully others] will want to return to see more of this most exciting and enterprising project.

*Andrew Jackson*

## LADIES LUNCHEON

**4 October 2006**

We were privileged this year to enjoy the Ladies Luncheon in the Armourers' Hall.

Forty eight ladies attended the champagne reception in the Drawing Room which was enhanced by Commodore Christopher Waite RN giving us an account of the history and tradition of the Armourer's Company. Our attention was directed to the superb copy of the famous Ardebil Persian carpet at the Victoria and Albert Museum and to the armour on view which belonged to Sir Henry Lee.

After the Master's Lady, Mary Gibson, so gracefully received us in the Drawing Room, we moved into the impressive Livery Dining Hall. On display was the 16th and 17th century arms and armour and everybody admired the three George II chandeliers.

We found our seats and grace was said by the Master's Lady. We then enjoyed a delicious lunch of Gateaux of White Crab Meat, Gigotin of English Lamb, finishing with Water Melon and Red Current Tartlet. Afterwards we raised our glasses to the Queen and to the Lord Mayor and the City of London Corporation.

The Master's Lady then introduced our Principal Speaker, Mr Murray Craig, Clerk to the Chamberlains Court. Mr Craig gave us a most interesting and amusing talk on his experience as Clerk of the Chamberlains Court.

The importance of becoming a Freeman of the City of London lies in the fact that such status is required to become admitted to the Livery of a Company and required to hold a civic City Office such as Lord Mayor, Alderman, Sheriff or Common Councilman. The first signs of freedom being granted can be traced back to 1175. Records held by the Chamberlain of London and administered by the Clerk are virtually complete from 1861.

As in the past the privilege of Freedom is eagerly sought and Mr Craig has enjoyed his role in granting the Freedom, with due ceremony to a wide ranging and fascinating list of candidates. His recounting of meeting with such personalities as the Archbishop of Canterbury, Rupert Murdoch, Tony Adams and the

handkerchief waving Pavarotti gave a light hearted completion to an excellent talk.



*Murray Craig, Mary Gibson and Moira Smith*

Mrs Ann Bawtree, the Senior Warden's Lady gave thanks to the speaker and the Master's Lady closed the most enjoyable proceedings by presenting a small gift to Mr. Craig.

*Moira Smith*

## MANSION HOUSE BANQUET

**27 October 2006**

As is traditional for the Company in the autumn we were privileged to hold our Annual Banquet at the Mansion House on Friday, 27 October. The Lord and Lady Mayoress were 'at home' and we were very pleased that they, together with the new Sheriff, Richard Regan and his wife Ann, were able to honour us with their presence. In line with the current practice of making the Sheriffs take a more prominent role during their year, Alderman and Sheriff, David Lewis, was on duty elsewhere.

After the reception, during which we were able to admire the treasures of the Mansion House as well as meet with many old and new friends, we were called to dinner in the magnificent Egyptian Room and a sumptuous dinner. With the first course we enjoyed an English wine from Denbies vineyard which is owned by the Principal Guest, Adrian White, High Sheriff of Surrey.

After dinner there were three speeches by the Master, the Lord Mayor and Adrian White and each was a



splendid mixture of mirth and an important message regarding the City and Engineers.

*Raymond Cousins*

### **Extracts from The Master's speech**

A very warm welcome to our 23<sup>rd</sup> Annual Banquet, 19 of which have now been held here in the Mansion House. My earliest experience of the inside of the Mansion House was when I attended the first Banquet of the Engineers' Company in October 1984. My son, James, managed to beat me by some 4 years as he attended the Lord Mayor's Fancy Dress Party here in January 1980. Along with other members of the Company, I also had the privilege of attending the first function to be held here in September 1993 when the Mansion House re-opened. On that occasion the then Lord Mayor and Past Master Engineer, Sir Francis MacWilliams, opened his speech with the words "Welcome Home". My Lord Mayor although the Mansion House is your home, we, and I am sure many other Livery Companies, have always felt at home and we are most grateful you have once again given us permission to dine here this evening. Earlier this year a number of us had the delights of a tour of the Mansion House and I am sure all those on the visit have now a much greater appreciation of its history and treasures. The visit to the vaults was particularly interesting to see the City Plate some of which is on display this evening.

The building of the Mansion House has some similarities to the new Wembley Stadium. It took 13 years to build and when it opened in 1753 the costs were more than double the original estimate and the project was plagued by constant litigation. No beams large enough could be found; the bricklaying didn't go smoothly – no bricks, sub-standard bricks, badly laid bricks, no space to store bricks, lack of payment for bricks and lack of progress in laying bricks were all the subject of lengthy correspondence and debate. The building has, however, served the Corporation well and it well deserved the comprehensive refurbishment in the early 1990's which has resulted in the magnificent building we see today and which made such an excellent venue for Her Majesty's 80<sup>th</sup> Birthday Luncheon at which my wife and I had the honour of representing the Company. Lord Mayor, we are delighted you are accompanied by the Lady Mayoress, Mr. Sheriff Regan and Mrs Regan and the Duty Household officer, the City Marshal Billy King-Harman.

A few weeks ago, the Clerk and I attended an excellent lecture given by Sir Ralph Robins, the former head of Rolls Royce and a guest at our Banquet in 1998, on the development of Rolls Royce Engines. Two days later at Common Hall, the Assistant Town Clerk told a story which, given the lecture, seemed particularly appropriate. Rolls Royce had designed and built a gun to fire chickens into jet engines to simulate bird strikes. An American firm building a high speed train thought the gun might be useful to test the drivers' wind shields and a gun was purchased and delivered. However when the chicken was fired at the engine, it shattered the screen, travelled through the drivers' seat and embedded itself in the bulkhead. Suitably mystified and after checking all their calculations they sent the test results to Rolls Royce. Almost immediately a three word reply was received "Defrost the chicken".

At our 10<sup>th</sup> Anniversary Banquet in Guildhall in 1993, our Honorary Liveryman & Assistant Emeritus, HRH The Duke of Kent congratulated the Corporation on its foresight and initiative in promoting the formation of new Livery Companies a process that is still on-going. It is this ability to continually adapt to changing circumstances which has allowed the City, both financial and civic, to maintain its pre-eminent position. Lord Mayor, you have our support as you and others in the Corporation work to improve the appraisal system for future mayoral elections and I know you will maintain the flexibility for which the City is renowned. Please remember however that Engineers have always been multi-talented and multi-faceted as your three Engineer predecessors proved so well. When, one of my job titles was that of Director of Finance I used to say, perhaps provocatively and with due respect to the Lord Mayor-elect, that whereas any engineer could become an accountant, not all accountants could become engineers.

One of the objectives of the Company is to support the Lord Mayor, Aldermen and Corporation of the City of London in all matters relevant to the life and dignity of the City. Having been associated with the Company from its earliest days, I know how well we have embraced and sometimes modified, albeit slightly, so many of the City traditions and as I said earlier it has been a particularly pleasure to support you, My Lord Mayor, during your year. Your chosen charity is Treloars which was founded by Sir William Purdie Treloar, Lord Mayor in 1906 and it therefore very appropriate you should be President of

the Centenary Appeal. Although we weren't able to join the visit by Livery Masters earlier in the year, Mary and I were invited to the College two weeks ago. It really is a most amazing place with so many children having to cope with often quite horrendous disabilities. Their obvious enjoyment of life is infectious. On this and an earlier visit some years ago, I had an opportunity of visiting the Rehabilitation Engineering Department and meeting the small team of engineers and technicians who manage to adapt and modify wheelchairs and other equipment to cater for each child's needs and abilities. It therefore gives me great pleasure to present you, My Lord Mayor, with donations from our Charitable Trust Fund for Treloars and for the Mansion House Scholarship scheme.

I would now invite everyone to rise and to join me in the toast.

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

*Bryan Gibson*

### **SPEECH BY THE LORD MAYOR ALDERMAN DAVID BREWER CMG**

Thank you Master for the Civic Toast and, for the cheque for Treloar's and the Mansion House Scholarship Scheme.

A hearty welcome to the Mansion House this evening. For those of you who have not been here before, it was built in Hogarth's time as a symbol then, as it is now, of London's supremacy as the world's leading international finance centre.

And on this, the very evening of the twentieth anniversary of Big Bang I hope you will forgive me if I mention that, in relation to our size, the UK is now the most successful country in the world in generating net investment income. The growth of UK financial services since 1992 has been more than double that of the UK economy as a whole.

So far this year, there have been just 17 international initial public offerings on the New York and NASDAQ stock markets, worth \$6bn in total. This is in stark contrast to the booming London IPO scene, where the London Stock Exchange and its small-cap Alternative Investment Market have grabbed 59 floats worth \$16bn.

Financial services productivity has grown more than three times as fast as that of the economy as a whole, and, in one of the most telling statistics, in the past eighteen months, the assets handled by fund managers in the UK have soared by 30% to more than £3 trillion.

Who would have thought that twenty years ago?

I am more than aware that the past twenty years have been a curate's egg for British engineering. Yet there have been some signal successes which are largely unheralded.

And it is one of the roles of this Company in that it shines the light of publicity and acknowledgement on British engineering today. There is no other engineering body can gazump this Company in the imaginative way it supports engineering in this country.

Now before I finish, one other accolade. As you know, Master Wax Chandler, your desire to create a breathtaking hall for yourselves, the Plumbers and the Engineers is warmly appreciated by everyone. Everyone that is with earplugs. But we know the work will be finished soon and look forward to seeing the results.

Of course, it means that the Engineers will need a complete new IT system. So in the spirit of singing for my supper I thought you might like some advice I read recently in the letters column of my favourite IT publication Modems for Mayors

*Dear Tech Support:*

Last year I upgraded from Boyfriend 5.0 to Husband 1.0 and noticed a distinct slow down in overall performance, particularly in the Flower and jewellery applications, which operated flawlessly under Boyfriend 5.0.

In addition, Husband 1.0 uninstalled many other valuable programmes, such as Romance 9.5 and Personal Attention 6.5 and instead installed undesirable programs such as: Football 5.0, Rugby 4.3 and Cricket 3.0.

Conversation 8.0 no longer runs; it simply crashes the system.

Now, I've tried running Nagging 5.3 to fix these problems, to no avail.

What can I do?

Signed,  
Desperate

*Dear Desperate:*

First keep in mind that Boyfriend 5.0 is an Entertainment Package, while Husband 1.0 is an Operating System. Try entering the command:C:/I-THOUGHT-YOU-LOVED-ME to download Tears 6.2, which should automatically install Guilt 3.0.

If that application works as designed, Husband 1.0 should then automatically run the applications Jewellery 2.0, Flowers 3.5 with upgrade of Massage-with-fragrant-oils-by-candlelight available as a download.

But remember, overuse of the above application can cause Husband 1.0 to default to Grumpy Silence 2.5, Happy Hour 7.0, or Beer 6.1.

WARNING: Beer 6.1 is a very nasty program that will create Snoring Loudly.

CAUTION: Whatever you do, DO NOT install Mother -in-law. This is not a supported application and will crash Husband 1.0.

In summary, Husband 1.0 is a serial single task program with limited memory and cannot learn new applications quickly.

However, you might consider buying additional software to improve memory and performance. I personally recommend Cava Connect, Hot Food 3.0 and Lingerie 7.7.

Good Luck,

Tech Support

Thank you!

**SPEECH BY THE HIGH SHERIFF OF  
SURREY ADRIAN WHITE**

Masters, Wardens, My Lord Mayor, Fellow Engineers, Ladies and Gentlemen, I hope that I am being politically correct in addressing our Leader as 'Master' and have wondered what I would have said had he been a Lady ! In the water and sewage industry we have the same problem with knowing what to call manhole covers. In fact it is serious as

Engineers could become a dying race if we become so politically correct that we can no longer have male and female couplings!

However, as Sir Walter Raleigh said, that great inventor of the bicycle, "the longer the spoke the greater the tyre". It is my duty to speak to you tonight but it is yours to listen to me, so I ask that if you finish before I do that you be kind enough to exit the room quietly.

Mention has been made of my Vineyard and it was your Master who, some time ago, asked me whether I believed in 'free speech' and when I said yes, I was invited here this evening but "would I please bring along my own wine and enough for everyone else as well!"

After such an enjoyable Dinner it is perhaps inappropriate to speak about sewage treatment- it is rather like the man who was offered a salad with slices of tongue, who said "I don't eat anything that comes out of an animal's mouth, I'll have a boiled egg!"

The same man, an Engineer, was asked by his wife whether he would like something special for his 50th birthday. He said, "Something that will go from 0 to 200 in 5 seconds!" His wife therefore bought him a set of bathroom scales.

As High Sheriff for the County of Surrey I have a responsibility for looking after the Judges, Magistrates and Bailiffs as well as attending Court and one case was particularly interesting as it was about a man who had been driving somewhat erratically and had been pulled over by the Police." Sir", the policeman said, "I want you to blow into this bag." "I can't," said the man. "Why can't you?" asked the policeman. "Because I might have an asthma attack and I might die." "In that case Sir, I must ask you for a urine sample." "I can't," said the man. "Why can't you?" asked the policeman. "Because I have had a colostomy and it's all in a bag." "Well in that case Sir, I must ask you for a blood sample." "I can't," said the man. "Why can't you?" asked the policeman. "Because I am a haemophiliac and I might not stop bleeding and I might die." "In that case Sir, I must ask you to step out of your car and, you see that white line down the side of the road, well I want you to walk straight down it." "I can't," said the man. "Why can't you?" asked the policeman. The man said, "Because I'm drunk!"

However, I digress...

A gherkin-shaped building can be the inspiration and design of an architect but it takes an engineer to build it, but sadly today we are not educating enough engineers for tomorrow. Today's students taking 'A' levels in Mathematics, Chemistry and Physics are now a tiny proportion of the whole, the balance of whom have elected to favour the Classics, the Arts, Sociology, Music and so on.

Where, Ladies and Gentlemen, are the apprentices? The apprentices which, 200 years ago, were the shop floor of the 'Industrial Revolution'. Where are they today?

Yesterday we had the calculator and now, today, the computer which has enabled engineers to leap forward in design, testing and analysis. However, without apprenticeships the practical realisation and application of basic engineering is lost, and the basic grounding missing.

We were a "Nation of Shopkeepers" and could become so again unless we use our renowned inventive skills, together with the ability to exploit our inventions commercially.

Ladies & Gentlemen, it is already feared that China is becoming the world's factory, America its sales force, Britain its service industry, Europe its Government and Africa its Charity Shop.

Engineers are still regarded as more a blue collared worker than a white collared technocrat and it is this Worshipful Company that needs to open up the Engineers' skills to the level of excellence that they deserve.

May I offer you this poem:-

A man knocked at the Pearly Gates,  
His face was scarred and old,  
He stood before the man of fate, for  
Admission to the fold.  
"What have you done?" St Peter asked,  
"To gain admission here?"  
"I've worked for Architects and Governments as an  
Engineer,"  
He said, "for many, many a year."  
The Pearly Gates swung open wide  
St Peter touched the bell,  
"Come in and choose your harp", he said  
"You've had your share of hell!"

Ladies and Gentlemen, may I end on a serious note.

Our world today faces the greatest need for inspirational and creative engineering than ever before. Global warming is not a threat that can wait to be addressed by our grandchildren. To compound this, the world population growth has created a demand for water and food that also cannot wait to be met by our grandchildren.

These are demands that can be addressed, but not met, by politicians.

Ladies and Gentlemen, these are demands that have to be met by Engineers. Petroleum, oil, chemical, motor, electrical and nuclear engineers will and are finding ways to reduce carbon emissions. Agricultural, water, civil, marine, structural, environmental and consulting engineers will build efficient transport, irrigation, wind and solar power, all to help access and quench the world's thirst and satisfy the world's hunger.

We, as Engineers, who invent, design, create and think laterally, will be the saviours of this planet, so let none of us relax, or leave to politicians, the work that needs to be done now. Our complacency could leave the world doomed to untold erosion of land and water sources, failed harvests and the early deaths of untold millions of Africans, Asians and South Americans.

Noah may have saved the living world once but it is us, the Engineers, who are needed to save it now.

Ladies and Gentlemen, may I propose a Toast to "The Worshipful Company of Engineers; may it flourish root and branch for ever".

## CAROL SERVICE 13 DECEMBER 2006

### Saint Peter-in-chains and the “courageous” choice of menu

The Annual Carol Service took place on Wednesday 13<sup>th</sup> December 2006 in the Chapel of St. Peter ad Vincula, being the Parish Church within the Tower of London. The present medieval chapel was completed in 1520, but has its roots in Norman times, dating back to 1105 AD. Decorated with a Christmas tree that was obviously rooted (there being no evidence of a door of sufficient size to bring it through), the chapel provided a unique canvas for the traditional service of lessons and carols.



*The Reverend Paul Abram outside the Chapel*

The Revd. Michael West, the Company’s Chaplain, conducted proceedings, unfortunately prefaced with the news of the sad death of Sir Peter Gadsden, founding Master of the Company. The Chapel’s Chaplain, the Revd. Paul Abram welcomed the group of nearly 200 members and guests to the final Engineers’ Carol Service that he would be hosting due to his forthcoming retirement and gave a fascinating and passionate presentation about the chapel and its origins. The choir, conducted by Colm Carey, sang a

number of traditional Christmas carols, supplemented by the voices of the congregation in a near perfect acoustic environment. It was testimony to the skills of the choir that, when faced with the orchestra of a passing river tug siren whose volume was greater than that of the organ, continued shaken but not stirred. The organist, Sam Gladstone, provided accompaniment on the 17<sup>th</sup> century organ, carved by Grinling Gibbons (of pea-pod fame), and recently restored in Quebec. Although we were let into the secret that it is now computer controlled, his dexterity and sinisterly of hand and foot were demonstrated with a fascinating rendition of John Rutter’s arrangement of “The twelve days of Christmas”. Lessons were read by the Junior, Middle and Senior Wardens, the Master and his Lady, the Clerk and the Chaplain, the latter to the tune of a mystery mobile phone that reminded a proportion of the congregation to switch their own instruments off.

Following the service, a privileged half of the assembled entourage were addressed by Yeoman Warder Richard Sands who gave a fascinating and amusing presentation about the Tower, the Chapel and being a Yeoman Warder. His detailed history of the executions, escapes and personalities of the Tower demonstrated his depth of knowledge, only a fraction of which we had time to explore. Assembled members were informed that the chapel was the burial ground of many famous individuals, not just those, such as Anne Boleyn, who had met their untimely end in the Tower.

The Carol Service Dinner was held in the Carpenters’ Hall, in Throgmorton Street. Due to road works, this ½ mile trip gave members of the Company and their guests a most interesting coach tour of the City before their arrival at the venue. The Carpenters’ hall was built in 1956. The original hall dating from 1529 survived the Great Fire of 1666, but was demolished and re-built in 1876 in an Italianate style. However this was, unfortunately, completely burnt out during an air raid in 1941. Unsurprisingly, the hall displays a considerable amount of wooden architecture, perhaps the most striking being the ceiling of the banqueting hall, which was designed by Clifford Wearden of Sir Basil Spence’s practice. During the reception, several people were noted inspecting the woodwork around the building in a manner that clearly identified them as being engineers.



*The Master in front of a Lime Wood Carving installed in Carpenters' Hall in 2005*

The Master introduced dinner by noting that his choice of menu had been considered “courageous”. However, it was quite clearly considered more than this by the hosting caterers who decided that we should eat something completely different. The absence of a menu provided interesting table discussion and much guesswork into the origin of the main course, which transpired to be “wild pork” rather than some of the more exotic meats suggested. As ever, each table was engaged in a buzz of conversation.

Following dinner, the Master gave a number of further lessons on the history of the Carpenters’ Hall and the history of the Carol Service, this being our 11<sup>th</sup> in the Tower and thanking Paul Abram for his particular contribution to the service over the last 10 years. The Master presented Paul with a pair of goblets as a reminder of his time with the Engineers’ and wished him a happy retirement. In his speech, the Master thanked Stephen, our Beadle and Graham, our Clerk

for their service over the year, in particularly difficult circumstances during the refurbishment of Wax Chandlers’ Hall and wished everyone a very happy Christmas and a prosperous New Year.



*The Clerk in normal dress for the office in Wax Chandlers Hall*

The Clerk responded in the traditional manner before calling for the Engineers’ Toast. In his speech, the Clerk described how business had been carried on “as usual” on a building site, and the additional challenges that this had presented to the pursuance of his duties. He thanked the Master, as former Clerk, for his guidance over the year, and described some of the high and humorous points of the previous year. The Clerk thanked Stephen, the Beadle for contributing beyond the normal ‘Beadling’ duties this year, and concluded by calling for the Toast

*David Johnson*

AN ALTERNATIVE POWER SOURCE

At the dinner after the Court Meeting on 10th October I had the pleasure of sitting next to Don Lennard who had been invested with the Livery at the end of the meeting. Amongst other things we discussed one of his abiding interests, the renewable energy source, Ocean Thermal Energy Conversion (OTEC). Never one to miss an opportunity to expand the debate on energy I asked for - Don offered? – a paper on this resource.

The paper follows and I am very grateful to Don for preparing this. What do you think? Is it viable? Is it going to be cost effective and give benefit to the problem of climate change? Views welcome.

Raymond Cousins

**OTEC - a Base Load Marine Renewable Energy, now with World-wide Application**

**Don Lennard BSc (Eng), FRAeS, FRINA**

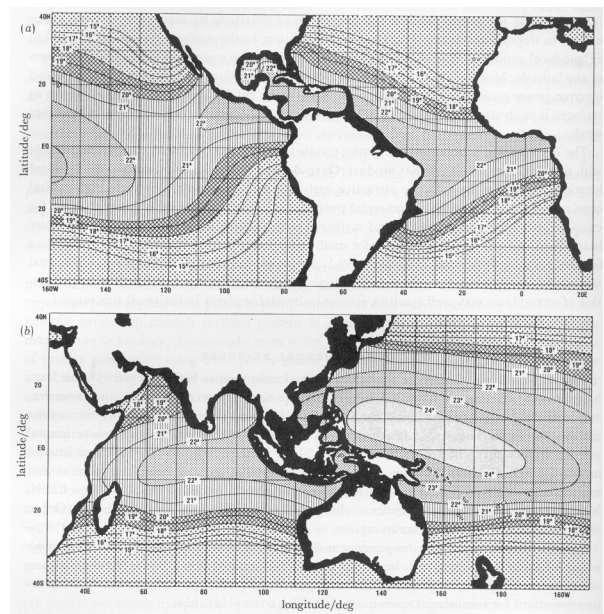
World scenario: climate change, energy use increase, problem?

Not necessarily - but to continue "as before" is just not an option. Renewable energies can be part of the solution - of which marine renewables can be a component - and offshore wind, tidal and wave are well documented. Unfortunately none are base load, so "supply and demand" have a potential major disconnect. With the current high price of oil another marine renewable - ocean thermal energy conversion (OTEC) - becomes economically attractive, and is base load, or to use the modern parlance it is available 24/365.

**What is OTEC?**

OTEC is solar energy. The surfaces of the oceans capture huge amounts of this energy – most of this being stored in the form of thermal energy in the surface layers of the oceans. However, those surface layers do not mix freely or easily with the deeper waters, which are much colder. OTEC is therefore based on the extraction of energy from that temperature difference existing between the warm surface waters of the oceans in tropical and sub-tropical areas from approximately latitudes 25° North to 25° South, and the deep waters in those same areas which flow from the polar regions – predominantly the Antarctic. Surface temperatures can reach as high as 29°C in the Pacific whereas the temperature at a

depth of 1000m will typically be 4°C, although this temperature can sometimes be found at depths as little as 700m. Figure 1 - the whole basis of OTEC - shows the temperature difference and distribution of this thermal resource world-wide.

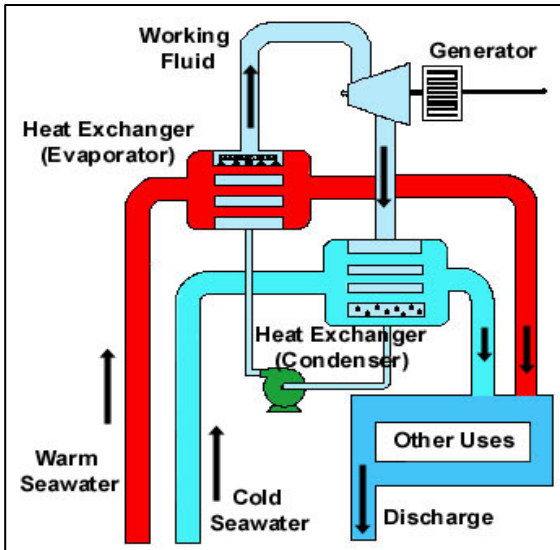


**Figure 1**  
**THE OCEAN THERMAL RESOURCE**  
 Average temperature differences in C degrees between the surface and a depth of 1000m.  
 Credit: US Dept. of Energy/Ocean Data Systems Inc.

The principal of OTEC was first noted as a potential energy source over 120 years ago by the Frenchman Arsène d'Arsonval who suggested using any working fluid having an appropriate vapour pressure at a temperature close to that of warm sea water, but it is developments in offshore oil and gas activities in the

last thirty or so years which have enabled a concept to be turned into a practical engineering reality.

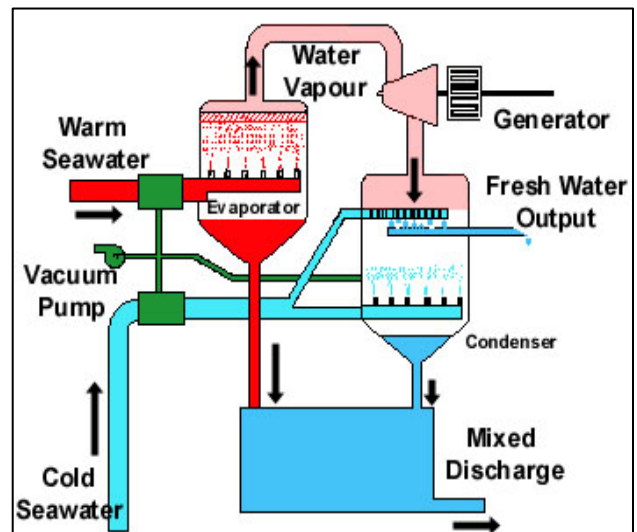
The OTEC power circuit is that of an absolutely standard heat engine cycle, but with the temperature difference much less than that in the case of an internal combustion, or even a steam, engine. By general agreement, the typical design case for an OTEC plant assumes a temperature difference of 20C degrees. After cooling in a surface condenser the liquid working fluid is circulated by pumping to the evaporator where the fluid changes to a gaseous phase – with a considerable increase in volume and pressure, passes through a turbine connected to an electrical generator, and is then recycled on through the condenser. This concept, Closed Cycle OTEC, is shown in Figure 2. Working fluids including ammonia, propane, butane, and freon are suitable. Closed Cycle OTEC requires the design and construction of large surface heat exchangers which are now within the limits of presently available technology to enable the construction of modular Closed Cycle OTEC plants with capacity of the order of a hundred MW.



**Figure 2**  
**Closed Cycle – OTEC Power Circuit**  
*Natural Energy Laboratory of Hawaii Authority*

Nearly fifty years after d'Arsonval a second option was proposed by another Frenchman, George Claude, where the working fluid is the vapour formed by the warm sea water itself when boiled in an evaporator maintained at an appropriate low pressure. Water

vapour is condensed either through a direct-contact condenser by mixing with cold sea water, or indirectly through a surface condenser. In that latter case desalinated water is an immediate by-product of the thermal process. In neither case is the condensed vapour reintroduced to the working fluid circuit and Claude's concept, Open Cycle OTEC, is shown in Figure 3. The main technical difficulty for Open Cycle OTEC plants comes from the low vapour pressure of the working fluid which means very large turbines and reliable sealing along lengthy joints in the turbine casing to maintain the low pressure.



**Figure 3**  
**Open Cycle OTEC: Power Circuit**  
*Natural Energy Laboratory of Hawaii Authority*

Apart from the closed- or open-cycle options, OTEC plants may be land-based, floating (and moored) or "grazing". Clearly a land-based plant has some advantages in terms of cost and maintenance, but the disadvantage of (particularly) a longer cold water pipe to reach the cold resource - giving rise to greater frictional and thermal losses in the pipe. There is also a limited diffusion zone for the mixed discharge of the warm and cold waters, and also a restriction on access to the warm water resource. A floating plant has the additional costs of the floating structure, including mooring, and also of the power cables and riser from the plant to shore - so the advantage of a shorter cold water pipe and full 360° access to warm water has to be balanced against those increased costs. One way of reducing the costs of a floating plant would be to eliminate the moorings and power riser and cable to shore, allow it to "graze" - drift with the currents - and take power off by producing



(for example) hydrogen to be transported in liquified form by carriers shuttling between the OTEC plant and the market place to provide power anywhere in the world. By this means OTEC output is not confined to the tropical/sub-tropical areas where it is generated, but can be used world-wide - and again the current high price (US\$50+/barrel) of oil means liquid hydrogen production from OTEC is just about economically attractive.

OTEC is a base load renewable due to the thermal mass of ocean waters whose temperature varies little whether the sun shines or not, day or night, and where from summer to winter the variation in energy available will be no more than 10%. Most effort is still directed towards OTEC for production of electricity, although there can be a range of additional products, referred to below. Also, the current increasing emphasis on environmental aspects of power production is of considerable benefit to OTEC, with its environmentally benign nature.

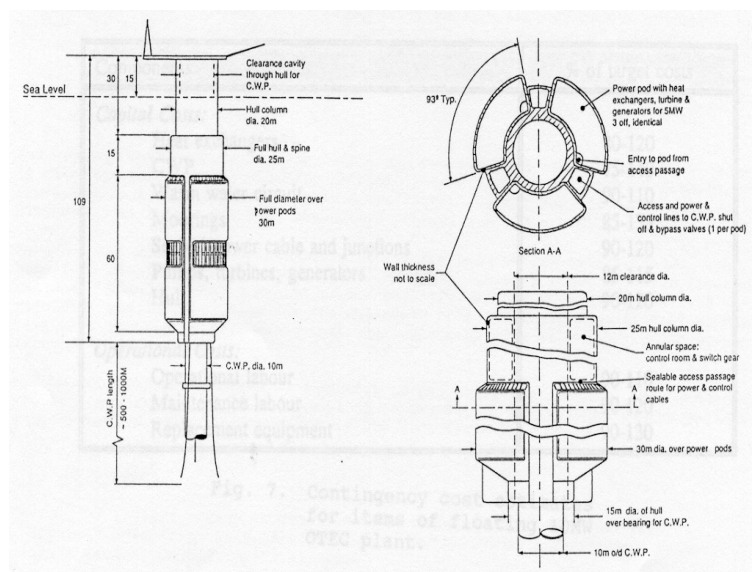
It is now the case that the greater part of an OTEC plant can be described as routine engineering - even the mooring of a floating plant in depths of 2000 metres or more has precedents from offshore oil and gas activities. Only the cold water pipe has to be classed as "significant further development possible", particularly for the floating variant. Working examples of both closed and open cycles have been built in recent times, and UK designs have been proposed for Jamaica, St. Lucia and Fiji, and most recently a US design for the Indian Ocean.

To give an idea of scale, the tropical/sub-tropical ocean regions most suitable to extract OTEC power have an approximate area of 60 million km<sup>2</sup>, and an approximate estimate of the potential scale of the world OTEC resource is 12,000 GWe or 18 Gtoe i.e. twice the 1990 world demand for primary energy.

**Other products from OTEC**

What may be considered bonuses for OTEC are the varied by-products which can result – under the heading Deep Ocean Water Applications (DOWA), which substantially enhance the economics as well. The Deep Ocean Water (DOW) used as the cold resource for OTEC plants is not only cold, but also nutrient rich and free of pathogens. These applications include aquaculture, agriculture, pharmaceuticals, and the production of fresh water. Fresh (potable) water can be a direct product of the open cycle system as previously explained. In the

case of the closed cycle, some or all of the power output could be used to drive a distillation plant. For aquaculture, it can be simply making use of the nutrient rich cold water, which produces growth rates considerably in excess of normal - be it for fish or crustacea. The same source can also be used to grow seaweeds and the like at enhanced rates, from which pharmaceutical products can be derived. Agriculture can benefit by piping the exhausted cold water, buried in the soil, and cooling the roots of products such as lettuce and tomatoes, which would otherwise not be capable of growing in tropical/sub-tropical areas. Clearly most of those applications are more readily applied to a land-based plant. One further "product" which could be derived from floating- or land-based plants is air conditioning - simply by using part of the generated power for that purpose. Clearly the mix of products will depend on consumer demand, but the combination of power and potable water is a mix for which there is - and will continue to be - enormous demand, within the developing world in particular.



**Figure 4**  
**General Arrangement of 10 MW Closed**  
**Cycle floating OTEC Plant**  
 Credit: Ocean Thermal Energy Conversion Systems Ltd

**Factors in the overall economics**

Because of the diffuse nature of most renewable energies, the size of the specific renewable energy generation systems is large when compared with fossil fuel generators, and their capital costs are proportionately large as a result. On the basis of

capital cost *alone* therefore, renewables - including OTEC - show up badly against oil fired power generation. Oil fired plants would typically cost a few hundred \$s per installed kilowatt, whilst OTEC would cost a few thousand \$s per kilowatt. And yet the case for cost 'comparability' is crucial to the acceptability of OTEC. An immediate balancing feature is that fuel oil has a substantial price, whereas OTEC fuel is free. Also, and as already mentioned, almost uniquely OTEC is a base load system which therefore has advantages over other renewables – they require buffer storage to achieve base load characteristics, with commensurate added costs. Maintenance costs for well developed oil fired plants are low, whereas the maintenance of low efficiency OTEC plants will (initially at least) be relatively high; and with the high capital cost of OTEC this means high total interest charges to be serviced in relation to the lower interest charges for the oil fired plant. All these points must be incorporated in the financial calculation if an accurate and realistic cost comparison is to be made.

Calculations show that small multi-product OTEC can be commercially attractive when the prices of oil fuel and fresh water reach respectively \$US30 a barrel and 0.85\$ m<sup>-3</sup> so the current oil price of above \$US50 a barrel is very good news for OTEC. The developing declaration of Exclusive Economic Zones (EEZs) has substantially changed for the better the legal title to operations outside national coastal areas, which is a key factor in obtaining finances for a plant.

#### **Figures for a 10MW floating closed circuit OTEC plant**

Figure 4 shows the components and layout of a typical closed circuit 10 MW demonstrator plant designed in the UK. As a demonstrator, it has three 5MW power pods, the 3<sup>rd</sup> pod for development, or use if either of the two main power production pods has to be shut down at any time. The floating plant consists of a single cylindrical hull in concrete, heat exchangers in plate form constructed from titanium/aluminium sandwich, a cold water pipe of 1000 metre length in fibre reinforced plastic, moorings in wire, chain, Kevlar or newer and transmission to shore over a distance of 10 km. All this resulted in a 2006 capital cost figure of \$115M - or \$ 11,500/kW.

The calculations for this 10MW floating Closed Circuit OTEC plant, designed for a Caribbean or

South Pacific island where the temperature difference varies from 23C degrees to 21C degrees between summer and winter, show a generating cost of 21 cents/kWh (using the 21C degree temperature difference) or - if potable water is a by-product (highly desirable for both these locations) - then the generating cost falls to 14 cents/kWh with the potable water costed at 80 cents/m<sup>3</sup>. Since island costs for potable water can be in the range 40-160 cents/m<sup>3</sup>, the figure used here is seen to be at the conservative end of the spectrum. For the two islands considered here the uplift (where landed fuel costs are compared with those in a developed country) is only 75% - much less than in many island states - so instead of \$25+/barrel, oil would be \$43+/barrel. At that price electrical generation from an oil fuelled plant would be costed at 11.5 cents/kWh. The OTEC demonstrator plant is therefore seen to be approaching cost competition with such a plant on these islands even if oil is at those low prices compared with current values.

In these examples no financial benefit has been given to OTEC for the environmental benefits which it claims, some of which it has in common with a number other renewables. A recommendation of the 1992 Rio summit was the introduction of a Carbon Tax for fossil fuels, but to date this has not been applied. If that is brought into use – as may well be the case by 2010 – then all renewables, including OTEC, will benefit further in terms of competitiveness with hydrocarbons.

Quite apart from costing figures, as just quoted, it is essential that an operator – or utility - also sees this new technology as attractive. For the figures given here a notional return of 20.4 %, corresponding to a real return of 14.7%, is calculated, both of which are reasonably attractive in terms of commercially accepted practice. So, for both the consumer and the plant operator, OTEC is beginning to look attractive - *extremely* attractive if oil stays at its present very enhanced cost levels.

#### **Likely Market**

Is there a market for OTEC - with or without DOWA? There seems general agreement that the greatest resource requirements for the world, as developed and developing nations progress through the 21<sup>st</sup> century, are water and energy - and the opportunity for linking OTEC and potable water has already been noted.

What then is the scale of the energy need? It is anticipated that the percentage of “new” energies will grow from a near-zero figure at the end of the 20<sup>th</sup> century to 6 % by the year 2020. Using World Energy Council figures, this translates into “new” energies of some 12,000 MW a year averaged over the period from 2000 to 2020. Capital costs for OTEC equipment is of the order of \$10,000 to \$12,000/kW because of its low efficiency, some ten times the capital cost for conventional power systems. If the OTEC capital cost figure is used as a basis the funding of “new” energies therefore equates to a total sum each year of ~ \$120 -145 billion. By any standards this is very substantial business and therefore for the construction, operational and financing sectors, an activity of very considerable interest

### **The Opportunity for OTEC**

The technical feasibility of OTEC can reasonably be described as "current state-of-the-art". What remains "new" is the design, construction and maintenance of the cold water pipe. In engineering terms this is no more of a task than many other technological challenges which are successfully addressed in the 20<sup>th</sup> and 21<sup>st</sup> centuries.

The business case for an operating OTEC plant is also now established - both in terms of the generating cost, and the operating return for a utility. So the commercial viability of an OTEC plant is therefore also now demonstrable.

As a renewable energy system, an OTEC plant will show substantial environmental benefits compared with fossil fuel generating plants, therefore contribu-

ting to meeting the Kyoto (and subsequent) protocol targets, which in turn will in part address the problem of global warming. Also, if and when the proposed Carbon Taxes are introduced, OTEC (and other renewables) will have their comparative economics further improved in relation to fossil fuels.

Additionally, as a base load system, OTEC has no need for back up or storage systems, which are required for wave/tidal/wind renewable systems if they are to be capable of matching supply to demand. All the above are for simple OTEC plants. If the DOWA are, separately or collectively, included both the economics and the flexibility of application are substantially further improved.

Via liquid hydrogen production OTEC can be usable in all parts of the world.

Finally, and after all these listed benefits have been considered, there is a very real social and human benefit to be counted. The tropical and subtropical areas where OTEC and OTEC/DOWA systems can be located include very many of the nations where their people live at a subsistence level, with minimal natural resources on land and with GDPs which are some of the lowest in the world. For these people two of the most basic requirements are potable water and energy - both readily provided by OTEC and DOWA. The natural resources of the seas in the EEZs of many of those countries could be harnessed via OTEC and DOWA systems - adding substantially to their GDPs, and providing the resources of water, energy and food.

In short, OTEC is a technology with world-wide application.

## ELECTION COURT AND DINNER

27 FEBRUARY 2007

Our traditional programme of Election Court Meeting, procession to Church, and then a reception and dinner is now well-established. This year because of the works in the Hall we held the Court Meeting and Dinner in the Barber Surgeons' Hall. The Master gave a short history of the Hall in his speech which I have included below.

At the Court Meeting Rear Admiral, David Bawtree, CB, DL, was elected Master for the ensuing year to serve with Senior Warden Elect, Tony Roche, FREng., Junior Middle Warden, Elect, Chris Price, FREng and Junior Warden Elect, John Robinson, FREng. They will all be installed into office on 24th April.

Also at the Court Meeting, Air Vice Marshal, Graham Skinner, CBE was reconfirmed as Clerk and the Rev. Michael West, FREng was reconfirmed as the Chaplain. In recognition of the way that Stephen Grundy's role has changed since he was appointed full time for the Company when we moved into Wax Chandlers' Hall four years ago when I was Master, he was elected at Assistant Clerk of the Company. I am very pleased that he should be my successor after nearly ten years. Also in recognition of the very dedicated service Stephen has give to the Company in the last twenty years the Court was pleased to elect him an Honorary Freeman, only the second in history of the Company.



*Stephen Receiving the Honorary Freedom of the Company from the Master*

At the end of the Court Meeting two new Liverymen were invested with the Livery and then are off to Church. Normally we would proceed in full robes

but the evening was very wet and the Clerk wisely made the decision that raincoats were the dress of the day!

The service at St Vedast alias Foster in Foster Lane was well attended by the Court and many Liverymen who arrived early for the subsequent dinner. St Vedast is a delightful Wren Church where we all sit facing each other as if we were in the Choir.

We all sang hymns, to familiar tunes, which had been carefully chosen to be appropriate to Engineers including:

Light a candle for achievers!  
Marvel at their range of thought:  
Artists, scientists, believers  
Famed for what their hands had wrought.  
For the feats of engineering,  
For each fresh, creative probe;  
Ev'ry benefit appearing,  
Spread across a shrinking globe.

The Chaplain conducted the service and gave a very thoughtful address which is reproduced below:

*Chaplain's Address:*

When we were together for the Carol Service, Mary, our Master's lady, read Betjeman's poem "And is it true?"

And is it true,  
This most tremendous tale of all,  
Seen in a stained-glass window's hue,  
A Baby in an ox's stall ?  
The Maker of the stars and sea  
Become a Child on earth for me ?

No love that in a family dwells,  
No carolling in frosty air,  
Nor all the steeple-shaking bells  
Can with this single Truth compare -  
That God was man in Palestine  
And lives today in Bread and Wine.

That question, “And is it true?” rang in my ears on and on through Christmas. I suppose people sending “Season’s Greetings” cards and even “Winterval” cards seemed to highlight the question “And is it true?” And sometimes, perhaps in defiance, we cling unreasonably to images of sheep and a baby, wise men and a star.

At Christmas I received Richard Dawkins’s book *The God Delusion* where this evangelical atheist argues that “God” is a nonsense and a dangerous nonsense at that. The final straw for me was listening to that character in Porgy and Bess, *Sporting Life*, singing:

*It ain't necessarily so  
It ain't necessarily so  
The t'ings dat yo' li'ble  
To read in de Bible,  
It ain't necessarily so.*

So I ask the question—I ask it of myself and for you to ponder—is it true?

I have come to the conclusion that a great deal of what has come down to us from tradition, frankly, is not true. Or, let’s say—unhelpful. It is unhelpful to us and even more to people searching for God who look to us for help. Many of these ideas have come to us from old hymns and pictures created in a different age to help people with greatly different life experiences.

Many of these hymns remain great favourites, often for the music rather than the words, but they really don’t speak of our experience of life or our experience of God within our life. They are from a different age. And, similarly, this is true of much of the imagery that surrounds our “faith” life. Either it *doesn't* reflect our faith or, if it does, maybe our faith needs thorough re-examination.

It is against this background that I believe Dawkins’s book is a real wake-up call to all faithful people—

and not just Christians. I want to say two cheers for Richard Dawkins. And, equally, I am grateful to Mary and to *Sporting Life* for making me re-assess my faith both rigorously and radically.

Dawkins is mainly challenging “yesterday’s ideas”. He spends a great deal of time demonstrating the truth of evolution and countering what he assumes to be the view of most faithful people that “creation is so complex, it can only have been made by a God”. I know that some people do still hold to the “God of the Gaps” idea (perhaps especially in Bush’s America) but “God” isn’t a name for the things we don’t understand. Dawkins also challenges the notion presented by some apologists for religion that “science has no role to play in questions of faith”. These apologists say that science is about *how* and faith is about *why*—so science has nothing to offer.

This is not really valid—from either point of view. Science is about *how* (certainly) but it is philosophy that is about *why*; and that doesn’t necessarily involve God. It is reasonable, therefore for someone to examine scientifically the possibility of the existence of a God-figure. And this is what Dawkins does and concludes—perhaps not unreasonably if one is looking for scientific/verifiable proof—he concludes that it is highly improbable that any “God” figure exists.

Am I—are we, then, deluded?

Look at the Bible—not for evidence but for “ideas”. The Bible is the collective experience of generations of faithful/prayerful people; it suggests that, when we look for the nature of God, we should look to our families. Well then, could Dawkins show scientific/verifiable proof that he is loved by his wife? No, but I hope and trust he experiences the joy of that love. Similarly, I cannot show proof that I am loved by “God” but it has been my experience for years; it has been a very real and a joyful experience.

My idea of God has changed dramatically over the years—thanks to life’s experiences, to the wonderful revelations of science (yes, science is one of the greatest revelations of God) and, thanks too, to reading the bible and many other books by faithful/prayerful people who are not figures of history but our contemporaries.

We simply must not keep those different parts of ourselves—our faith, our science, our experience—in separate boxes; they must inform each other. If they can’t, if they don’t; then something is wrong with our faith or our science and our experience of the world. And, almost certainly, it will be our faith that is wrong. This past weekend we marked the 200<sup>th</sup> anniversary of the abolition of the slave trade; there was a wonderful example of revelation prompting a re-evaluation of bible interpretation and faith.

Yes, my idea of God—no doubt, your idea of God—has changed but not my “faith”. Faith isn’t based upon facts about creation or even about assessments of probabilities but on experience—the experience of the presence of God in our lives. “And is it verifiable?” as Dawkins might ask—not in the same way for each person as the scientific method would require. However, it is my experience that when people “open themselves”—open themselves to what might be beyond themselves—they experience God’s presence and God’s love. I have, I know many of you have, and I know that everyone can when they open themselves—sincerely.

“And is it true?” Yes, that deep, inner meaning of the Betjeman poem is profoundly true.

We returned to the Barber Surgeons’ Hall uplifted and ready to enjoy more secular things. After the reception we sat down to an excellent dinner beneath Holbein’s portrait of King Henry VIII and many surgeons of his day. This dinner limited to Liverymen only was traditionally when the Master reported on his care of the Company during the year but this has now moved to the report and Common



*Barber Surgeons’ Hall*

Hall . The Master Elect and Wardens Elect were introduced to the Livery and the Master exchanged a Loving Cup with each to wish them well in their year of office.

The Master then proposed the toast to the new Liverymen inviting them to tell us about their life and career.



*The Master Elect,  
Rear Admiral David Bawtree CDBL*

Having established tradition within various Masters during his time as Clerk, Bryan, as Master, is busy creating new ones and he was pleased to exchange loving cups with the Clerk, Chaplain and our new Assistant Clerk and Beadle during his speech which is attached below.

*Raymond Cousins*

*Master's Address:*

Firstly my congratulations to David on his election as Master, to Tony and Chris as they move further up the ladder and to John as he starts his journey.

At the Court Meeting earlier this evening, two new Liverymen were clothed in the Livery. It is a pleasure to welcome Bjorn Conway and John Craik to our Company. A few years ago, the Court agreed that Chartered Engineers who were not yet Fellows of their Institutions could be admitted to the Freedom although their progress to the livery would still be dependant on obtaining Fellowship. Bjorn Conway was the first Freeman to be admitted under these new procedures and having been mentored by Court Assistant David Scahill, he was recently elected to Fellowship of the IMechE and so became eligible for the Livery. I very much hope Bjorn will be the first of many young engineers to follow his example.

Now a little about Barber Surgeons Hall which we have visited on a number of previous occasions. We held our Installation Dinner here in April 1991 when Trevor Crocker was installed as Master and then in October 1998, this was the location for Winifred Mitchell's Ladies Luncheon.

The unavailability of Wax Chandlers' Hall has meant we have been able to visit or revisit other Halls and as some of you will know I have been using the opportunity to give a short history of the Halls in which we are dining. One of the first things that was needed when the guilds started were places in which they could meet. From the 1440s the Barbers had their Hall on the edge of the City in the area of the old Roman Barbican. It was built in Monkwell Street and consisted of a single room with domestic offices for the serving of dinners. In 1605 it was decided to add a Court Room which was completed in 1607. In 1615, after serious structural faults were found, much restoration was carried out and in 1635 the Court agreed that an Anatomical Theatre for lectures and demonstrations should be built. This was designed by Inigo Jones and followed the pattern of a lecture theatre in Padisa; at about the same time a new Great Parlour was built but unfortunately most of the property was burnt in the great fire of 1666 with only the Anatomy Theatre being saved. The destroyed buildings were replaced at a cost of £4292 and remained substantially the same until 1784 when the Anatomy Theatre was demolished to make way for

housing. In 1869 the buildings were further reduced so that the Company only retained the Court Room which was built into Bastion 13 of the City wall and was regarded as one of the best small halls of the City Companies. On the night of Sunday 29th December 1940 the Hall was destroyed in an air raid although the bulk of the Company's more valuable goods and property were saved by having been taken to a secure place when war broke out. After an interval of nearly 30 years a new hall, in which we are in tonight, was built and opened by Queen Elizabeth, The Queen Mother in May 1969. A major reason for the delay was the need to come to an agreement with the City about the site. It was thought necessary that the City wall should be free from obstruction and thus an agreement was made for the new hall to be some thirty feet further east than its predecessor. The shape of the old being preserved in the Great Hall by the bow built on the west side. The new building was much larger than its predecessor and incorporates cellars and domestic offices in addition to the Great Hall, a Court Room, a Library, the Charter Room, a Reception Room and quarters for the Master. The whole is built into a small office block, which provides a useful income for the Company. The delay in rebuilding allowed the Company to demand a much higher specification than would have been possible if the rebuilding had taken place twenty years earlier. Due to arguments with the Apothecaries Company, the Company is now titled "The Worshipful Company of Barbers" but the hall is still known as Barber-Surgeons Hall.

Traditionally this dinner was an opportunity for the Master to report on his year in office but this function has now transferred under our Royal Charter to Common Hall in April. Nevertheless this is still an opportunity for me to cover some matters which are perhaps more appropriate to a 'family' occasion.

A Master's year is full and varied and Mary and I have enjoyed it enormously. However the year has also had a sadder side. We have in the last twelve months had the deaths of a number of very supportive wives whose presence at our functions will be sorely missed. Early in 2006, we had the death of a Founder member Sir Alan Veale followed by the loss of Past Master Len Weaver, Founder Master Sir Peter Gadsden and Liveryman Maurice de Rohan. These are all members I knew very well and I, and many others, have felt their loss acutely. Throughout, I and other members of the Company have had the support, guidance and prayers of our

Honorary Chaplain, Michael West – he really is a tower of strength and I am delighted that earlier this evening the Court reaffirmed his appointment. In a break with tradition, I would like you all to joining me in thanking Michael as I invite him to share a Loving Cup with me.

Unless you have actually visited Wax Chandlers' Hall in the last few months, you can have no perception of just how bad the working conditions have been as the refurbishment continues. No one, and certainly not the Wax Chandlers, had any idea of the amount of noise or dust that would be generated nor the extreme difficulties in simply getting in and out of the offices. Hopefully the end is in sight and we console ourselves by the thought that it will all be worth it in the end. Throughout, the Officers and the Livery have continued to receive excellent service from our Clerk and Beadle. It is easy to forget we have only been in existence for 24 years and how much has been achieved in that time. You will shortly be receiving the Annual Report and Accounts for 2006 which, I believe, shows another good year. However our continued success is almost entirely due to Graham and Stephen's hard work and dedication. Graham has provided real leadership in his advice to the Master, Wardens and the Court and in his management of the Company and it was a great pleasure to see his appointment re-affirmed at the Election Court this evening. In recognition of his many contributions I would now like Graham to come and join me in a Loving Cup.



*The Clerk Exchanges a Loving Cup  
With the Master*

Just over 20 years ago in January 1987, I asked Stephen, who worked for me at the Institute of Materials, if he would act as Beadle at a joint Court/Royal Engineers Dinner at Armourers' Hall.

He has served in that capacity ever since and in July 2002 he became a full-time member of staff when we moved into Wax Chandlers' Hall. Under Graham's guidance, Stephen is now responsible for most of the day-to-day running of the office and in recognition of his increased responsibilities, this evening the Court, whilst reaffirming his appointment as Beadle, formally appointed him as Assistant Clerk and it now gives me great pleasure to hand him his badge of office and invite him to join in a Loving Cup.

Our Ordinances allow the Court to appoint both Honorary Liverymen and Honorary Freemen although such appointments have been relatively rare. Appointments as Honorary Liverymen have been to recognise those who have served the engineering profession in its widest sense; the last such appointment being our Founder Master Sir Peter Gadsden in April 2004. Appointments to the Honorary Freedom have been seen as recognising contributions to the profession through service to this Company. The only Honorary Freedom to date was conferred on the late Hugh Rom when he retired as our Honorary Chaplain in 1997. However it gives me particular pleasure to announce that the Court agreed in January to mark Stephen's 20 years as Beadle to this Company and to recognise his contributions to the Company by appointing him an Honorary Freeman and I will now present him with his certificate.

Although I will be presenting the Annual Report at Common Hall in April, this is the last occasion on which I will address you at a Livery function. Mary and I have much appreciate all the support and encouragement you have given us over the last year. It has been a pleasure and honour to serve as your 23<sup>rd</sup> Master. Thank you all very much.

*Bryan Gibson  
Master 2006-2007*



## SIR PETER GADSDEN, GBE, AC, FREng 1929 – 2006

It is with great regret that we record the death of Sir Peter Gadsden, the Founder Master, on 4 December 2006.

Peter was born in June 1929 in Canada where his father was a Clergyman looking after a parish of 750 sq. miles. Five years later he moved to Ireland and then, at the age of 10, to Shropshire which thereafter he considered his home.

Peter was educated at Wrekin College and became School Captain. During National Service he was commissioned into the King's Shropshire Light Infantry and then he studied Geology and Mineralogy at Jesus College, Cambridge from 1949 to 1952.

The next two decades saw much travelling around the world being active work in the mining industry and becoming known as Trader Gadsden. He married Belinda in 1955 and they were blessed with four daughters.

His involvement in the City started in the sixties and he became a Liveryman in the Clothworkers' Company in 1965 and bought a flat in the Barbican in 1970.

He was elected to Common Council in 1969 and a year later fought and won a contested election for Sheriff. During his year as Sheriff a vacancy arose for an Alderman and he went on the hustings again and was duly elected as Alderman for Farringdon Without. At the very young age of 50 he became the 652nd Lord Mayor of London in November 1979.

Fully in character Peter put everything into his year as Lord Mayor and married the traditions of the City with the more modern requirements of the Business City which are still developing today.

In the 70s the first soundings for the foundation of an Engineer's Livery Company were being taken but came to nothing. In 1982 these soundings began to be more warmly received and more support was beginning to be forthcoming. Peter addressed the Annual General Meeting of the Fellowship (later Royal Academy) of Engineering in March 1983 and a few weeks later the Fellowship approved the formation of an association to petition the Lord Mayor of Court of Alderman of the City of London

for recognition as a Livery Company. With this support Peter then became the Sponsoring Alderman and the real work of forming the Worshipful Company of Engineers began. With Peter's enthusiasm and contacts the petition was approved and the Company was granted Livery status on 1st November 1983. This was undoubtedly the most rapid formation of a Company and Peter became the Founder Master for some 18 months until April 1985. I have written a fuller history of the early days which is published elsewhere but suffice to say that Peter's influence was absolutely invaluable in the formation of the Company and its continued development into what it is today.



*The Presentation of the Grant of Livery on  
November 1st 1983 by the Lord Mayor, Sir Anthony  
Joliffe, to the Founder Master, Sir Peter Gadsden*

'Thoroughly with Enthusiasm' is the title of Peter's biography which he took from the motto of his Coat of Arms and is a most apt description for his whole approach to life.. He was always very supportive of the Company and attended many functions. In September 2005 he enjoyed showing us part of his Northumberland estates as we drove on the A1 from Newcastle to Alnwick. In September 2006 during the Company's visit to Cornwall he was in his mining element during the visit to Geevor Tin Mine. Never stinting in his support he was pleased to provide a report on the visit which is published in this edition of The Swordsman.

Peter will be sorely missed in the Company of Engineers and our sympathies go out to Belinda, their four children and seventeen grandchildren.

*Raymond Cousins*

## PERSONALIA

During the last six months we have welcomed thirteen new Liverymen into the Company at three Court Meetings. This brings the total number of Liverymen up to 312 the largest that we have ever had. This is despite the sad loss of Maurice de Rohan, OBE, Agent General for South Australia and Liveryman from June 1999 and our Founder Master, Sir Peter Gadsden, GBE, AC, FREng. An obituary for Sir Peter is included elsewhere in this edition. There will be a thanksgiving service for Peter's life, St Bartholomew the Great at 11:00 am on Thursday, 19th April.

We also report the death of Elisabeth Hawtin in September 2006, An obituary of Elisabeth who was the wife of Assistant Emeritus, Philip Hawtin, was published in the on-line Swordsman.

In the last edition I congratulated Denis and Pam Filer on the celebration of their Golden Wedding on 17th August 2006. This caused a certain amount of consternation because I was a year early! Congratulations now to them both and best wishes for a happy day on 17th August 2007.

### **Congratulations to the new Liverymen invested on 10 October 2006**



*Professor Malcolm Henry POPE  
FIMechE FASME Dr Med Sc  
PhD DSc CEng*



*Norman HARRIS  
FIMechE BEng CEng FCMI*



*Ian Paul Randall EMERY  
BSc(Hons) MechEng FIMechE CEng*



*Donald Edward LENNARD  
BSc(Eng) FRAeS FRINA*



*Raymond Peter CLARK OBE  
BSc PhD Hon FRPS FSEE*



*Christopher James ELLIOTT  
FREng MA PhD Barrister  
MIEE FRAeS*

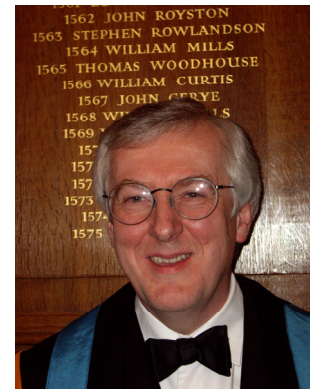
**Congratulations to the new Liverymen invested on 9 January 2007**



*Rear Admiral Philip Duncan  
GREENISH CBE BSc CEng FIEE*



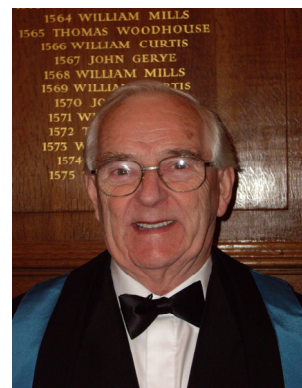
*Dr Peter John FENWICK OBE  
FIEE BSc MSc PhD*



*Professor Alwyn John SEEDS  
FREng FIET BSc PhD DSc*



*Eur Ing Dr Edmund James  
MORGAN-WARREN  
BSc PhD CEng CSci FIMM FINuc FWeldI*



*Eur Ing Joseph Edward ROBERTS  
BEng MEng CEng FIMMM  
MIMechE SenMWeldI*

**Congratulations to the new Liverymen invested on 27 February 2007**



*Björn Alex Paul CONWAY  
CEng, FIMechE*



*John Edward CRAIK  
DipEng, FIMechE*