

Champagne to England weekend proved a great success

During September, a party of 14 Fuellers and their Ladies enjoyed a splendid "Champagne to England" weekend at the George Hotel, Stamford. The event was arranged and hosted by our then Master, Richard Budge, who shipped copious quantities of champagne from France for the gratification of his guests. Richard greeted the participants on the Friday evening with a warm welcome. A champagne reception at the George was followed by supper in the "London" room. The champagne was superb and the meal delightful, in relaxed and convivial company.

Saturday morning offered the

opportunity to explore the beautiful town of Stamford, which on that day was bathed in glorious sunshine. It was noticed, as they pranced back to the hotel, followed by their menfolk struggling with parcels, that some of the ladies had really enjoyed their shopping spree.

On Saturday afternoon, the company visited Burghely House, an Elizabethan stately home built by William Cecil, Elizabeth the First's Lord Treasurer. The programme began with lunch in Capability Brown's Orangery, followed by a tour of the house. The many splendid rooms proved to be exceptionally rich in fine furniture,

paintings, tapestries and other treasures.

A formal dinner was held on Saturday evening, again in the London room. The party was told that the room was haunted, but in the atmosphere resulting from the presence of good friends and fine food, there was little inclination to contemplate ghosts; however, in celebrated Fuellers' tradition, no one was to be disappointed by the absence of spirits!

The Fullers' party were very appreciative of Richard and Rosalind's generosity and effort in providing what proved to be a superb weekend.

Bill Pretswell

THE WORSHIPFUL COMPANY OF FUELLERS MERCHANDISE ORDER FORM

From
Name.....
Address.....
.....
.....
Post Code.....
Tel No.....

Please send me the following items:

Item	Number required	Price	Total
Blue Silk Tie	()	£19.50	£.....
Blue Polyester Tie	()	£7.50	£.....
Cuff Links	()	£10.00	£.....
Lapel Badge	()	£4.00	£.....
Ladies Bar Brooch	()	£5.00	£.....
Wall Plaque	()	£30.00	£.....
Ladies Shield			
Brooch (only available for Lady Liverymen)	()	£65.00	£.....
TOTAL			£.....

I enclose a cheque for £..... made payable to "Worshipful Company of Fuellers".

Please return the form with your remittance to: Mrs Jane Ayre. 68 Portway, Baughurst, Tadley, Hampshire RG26 5PE
Tel: 0118 9813700

CITY AND COMPANY DIARY OF EVENTS 2003

Month	Day/Date	Event	Venue
January	Friday 3	2nd Fuellers' Game Day	Whiddon Down, Devon
	Thursday 23	H&E, F&GP Committee Meetings.	Venue -tba-
		Ladies' Day (Gilbert Collection) followed by afternoon tea	Somerset House, then Savoy Hotel
February	Thursday 20	Court Meeting followed by Court Dinner	Army and Navy Club
March	Thursday 25	City of London Briefing	Guildhall
	Friday 28	*United Guilds Service Followed by Livery Lunch H&E, F&GP Committee Meetings	St Paul's Cathedral; Stationers' Hall then Pewterers' Hall
April	Wednesday 23	Court Meeting followed by Divine Service and Election Court Lunch	Painters' Hall then Mansion House
		May	Wednesday 12
June	Wednesday 21	Inter-Livery Clay Shoot	Holland & Holland Northwood
	Wednesday 4	*Wine Tasting and Dinner	Painters' Hall
July	Tuesday 24	*Election of Sheriffs followed by Livery Lunch and Court Meeting	Guildhall/ -tba- then Wax Chandlers' Hall
	Saturday 5	Master's At Home (at the Newark home of Past Master Colin MacLeod)	Notts.
August	Sunday 17	Master's Birthday Party (Cruise on River Severn followed by Three Choirs Festival Concert)	Hereford
September	Wednesday 10	H&E, F&GP Committee Meetings	-tba-
	Monday 15	2nd Annual Fuellers' Golf Day	Wellingborough Golf Club
	Monday 29	Election of Lord Mayor followed by Livery Lunch and Court Meeting	Guildhall other venues -tba-

*Open to Liverymen only

This publication is produced and distributed by the Worshipful Company of Fuellers. Comments on this edition and suggestions for inclusion in future issues are welcomed and should be directed to :

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THE FUELLER

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The Official Journal of The Worshipful Company of Fuellers

Registered at Stationers' Hall

Is windpower spinning for a fall?

A fascinating insight into possible future energy developments was provided in a recent presentation by Professor Colin Humphreys, Goldsmiths' Professor of Materials Science at Cambridge and currently President of the Institute of Materials. Professor Humphreys was invited by The Worshipful Company of Founders to deliver their annual Robert Warner Lecture, taking as his title "UK Energy Policy — Tilting at Windmills?"

In opening his lecture, Professor Humphreys reminded his audience that the UK Government was committed to obtaining 20% of the country's energy requirements from renewable sources by 2020, in an effort to reduce greenhouse gas emissions. This would represent between 17-25 GW of wind power alone, equivalent to 15,000 wind turbines. Wind turbines were ugly, intrusive and noisy. They also provided, by their very nature, a fluctuating energy output, which in turn, gave rise to severe stability problems. The speaker suggested that wind power would incur £billions of additional costs, such as those for 16 – 19 GW of conventional back-up power for every 22 GW of windpower units. Whatever the rating of a wind turbine, its actual output was likely to be far less, as a result of intermittent and variable wind speeds.

Wind turbines could also be very expensive. This was particularly true of the latest 300 ft high versions which were to be sited on platforms five miles off-shore. In such an environment, maintenance was likely to be very costly.

Whereas power from conventional sources might cost 2 p per unit, wind power could cost over 5 p per unit.

Professor Humphreys was equally critical of the concept of generating energy from biofuels. The Drax coal-fired powerstation, the largest of its type in Europe, occupied the space of a few fields. However, to generate the equivalent energy provided by the station from biomass would need an area the size of Scotland to be put down to willow coppice.

The speaker then asked if there was a better way to reduce greenhouse emissions?

Globally, there was a 2-3% rise per year in the demand for electricity, requiring

some 3,500 GW of new power plants. Of these, it was likely that 70-80% would be fired by fossil fuel.

One way to contain the rise in CO₂ produced by such generating plant was to design super-efficient units which could utilise steam at 750°C. Such stations would be 16% more efficient than conventional plants. However, if turbines were to operate at these temperatures, then there would have to be a remarkable change in the metallurgy of the blades. These steel components would have to be replaced with nickel-based superalloy blading capable of resisting high temperatures over very extended lifetimes of say, 200,000 hr. Professor Humphreys then described Cambridge-based research on new superalloys for such blading, using neural network modelling based on aerospace data. There was also work being carried out on

the development of new steels for the construction of boilers and other plant capable of operating at much higher temperatures.

The lecturer spoke briefly on the progress of research on the capture of CO₂ emitted by power stations and the subsequent storage of the gas in undersea geological structures.

He then turned his attention to the concept of more efficient lightening, observing that the tungsten filament bulb, first introduced in 1879, was still the main source of lighting. In the UK, 20% of power generated was used for lighting, rising, for example, to as much as 40% in Thailand. Professor Humphreys then spoke of a possible alternative source of light — gallium-nitride-based light emitting diodes (LEDs) designed to produce white light.

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Our Master — Andrew Bainbridge

Our Master, Andrew Bainbridge, is a wellknown figure in the energy industry, having set up the Major Energy Users' Council on the advice of Lord Ezra 14 years ago. Says Andrew: "Some people have greatness thrust upon them and that is certainly true in my case. It is impossible for one very fallible human being to cope with all the complex issues involved in taking a Livery Company forward. Fortunately, I don't have to do it alone. I am supported by a team of very talented and committed people."

Andrew began his career in journalism in the North East at the age of 16. He joined the leading UK public relations consultancy at the age of 21, helping such big names as British Oxygen, Pilkington, Boots and Ford. He established his own public affairs and marketing consultancy 44 years ago at the age of 24 and cut his teeth in the energy industry working for multinationals such as Johnson Controls, Limited and Satchwell.

A Fellow of the Institute of Directors and a Member of the Carlton Club, he is particularly proud of his

involvement with the Honourable Society of Masters which has as its objectives the offer of counsel, support and protection to the business leaders within its ranks.

"Having the opportunity to serve the Fuellers as its Master is the second most important thing to happen to me in recent years", he says. "I am sure members will understand if I say that even more important is that I have just become a Grandfather. These two momentous events are making my year unforgettable."

Andrew is a Jaguar enthusiast whose hobbies include exotic holidays, classical music (he has two of Elgar's original letters) and reading books on business management.

He has spent considerable time during the past two years asking members what kind of activities they want to participate in and his programme reflects the pleas for more events outside London, for more energy industry involvement and for more information on the workings of the City of London.

Merchant Taylors' Hall was venue for Installation Dinner



The outgoing Master of the Fuellers' Company, Richard Budge, presents the Apprenticeship Certificate to Miss Ronnie Carey

The Merchant Taylors' Hall in Threadneedle Street was chosen for this year's Installation Dinner. There has been a Merchant Taylors' Hall on the same site since about 1390. The buildings were severely damaged in the Great Fire and again in the 1940 Blitz. While some parts of the Hall are mediaeval, the structure, as it now stands, was rebuilt after WW2 and reopened in 1959.

Before the champagne reception, the assembled Court had welcomed three new Court Assistants — David Bell, Nigel Draffin and Bill Pretswell. The Court also welcomed the Company's First Apprentice Fueller, Miss Ronnie Carey. Admitted as new Honorary Freeman were Cdr. Rod Steel RN and Grp Capt Paul Atherton RAF. The Court also welcomed several new Freeman, namely Lord Peter Hardy, Michael Clayton, Shравan Joshi and John Thompson. Installed as new Liverymen were Dr Richard Austen AO, Michael Ball, Michael Byrne and Peter Marshall.

The Court then welcomed members of the Company and their guests to the formal installation of Andrew Bainbridge as Master for the coming year, Douglas Barrow as Senior Warden and David Port as Junior Warden. Having been received by the Master and Wardens, the guests moved into the magnificent drawing room, wonderfully adorned with vibrant floral wall hangings, for the champagne reception. After friends had met again and new friends greeted, the gathering moved into the Great Hall for dinner.

The Company's guests included representatives from other Livery Companies, including Masters of the Founders' Company, Mr Anthony Newman, The Carmen, Mr Colin Barrett, The Launderers, Mr David Hart and a

Past Master of The Wax Chandlers, Mr David Jeffries. The Fuellers' were also pleased to welcome Lt Col Nick Goulding and Cdr Jerry Betteridge, HMS Sultan, and their ladies.

The magnificent panelled and galleried hall provided a superb setting for the dinner. Before grace was said, the Company Chaplain, The Rev Dr Peter Mullen, gave the diners a short talk about London and the traditions of the Livery Companies. During the meal, some of the assembled diners were able to celebrate with happy new Fueller grandparents, Mr and Mrs Johnstone who had just received a message about the safe arrival of their granddaughter. Musicians from the



The new Master of the Fuellers' Company, Andrew Bainbridge, with his wife Marianne

Guildhall School of Music played from the gallery during the evening, which was a delightful addition to the celebrations. The delicious meal and good wines were followed by the ceremony of the Loving Cup. Before proposing the loyal toast, the Master introduced the first Fueller Apprentice, Miss Ronnie Carey, to the gathering, and presented a bursary cheque to Miss Nicola Phillips of the Guildhall School of Music. The toast to the guests was proposed by the Senior Warden and the response was made by Ben Saunders, an intrepid young adventurer who told of some hair raising exploits with ice floes and polar bears. The splendid evening concluded with a further chance to meet friends over a stirrup cup before departing into the warm evening air.

Jane Ayre

Continued from front page ▼

Recent research on such devices was described at some length, the lecturer suggesting that if white LED's were perfected, dramatic savings could be made in power consumption. For example, if 50% of lighting in the USA was converted to LED's, there would be a saving of 25 GW, equivalent to 25 power stations.

In conclusion, Professor Humphreys said that, in his opinion, the reduction of CO₂ emissions by the utilisation of windpower was too expensive an option. More efficient power plants, based on steam turbines operating at 750°C, could provide a 16% saving in greenhouse gas emissions, whilst the introduction of white LEDs might provide a further 14% reduction in the generation of CO₂.

Welcome to our first Apprentice Fueller

Miss Ronnie Carey was admitted as the first Apprentice Fueller at the October Court Meeting, under the rules of the recently announced Apprenticeship Scheme. In welcoming her into the Company, the then Master, Richard Budge, said that it was a significant event, and he hoped that it would encourage more young people to join the Fuellers.

Ronnie is employed by E A Gibson Shipbrokers Limited, as a trainee Bunker Broker. She is following a structured programme which will lead to Membership of the Institute of Chartered Shipbrokers. Her work involves negotiations between buyers and sellers of ship's fuel, mainly gas and diesel oil, and providing up-to-date market information, technical know-how, and operational support. She is also responsible for maintaining good working relationships with the worldwide network of suppliers to ensure awareness of product availability, and of potential problems such as barge congestion, or even civil unrest. Ronnie has a BSc (Honours) Maritime Business and Admiralty Law degree, and lists amongst her interests golf, tennis riding, reading and travelling.

Members are reminded that the scheme is open to anyone under the age of 35 undergoing training for a post in the energy industry. Further details from the Clerk.

Meet Antony Reardon Smith — our Learned Clerk

Subsequent to the resignation of Ralph Riley, the Master, Wardens and Court of Assistants are pleased to announce that, with effect from 1 November, 2002, the new Clerk of the Company is to be Sir W Antony J Reardon Smith Bt KCLJ CMLJ.



Sir Antony J Reardon Smith Bt
KCLJ CMLJ

Antony Reardon Smith was born in South Wales on 20 June 1937, educated at Wycliffe

College, followed by National Service in The Royal Navy. He joined the London Office of the Reardon Smith Line and Sir William Reardon Smith & Sons, in 1959. In 1973, the company built three semi-submersible oilrigs in partnership with other shipping companies. He was Managing Director of the group operating the rigs.

The oilrigs having been sold by 1984, he left the company in 1985. He was then Managing Director of the World Trade Centre, London. Subsequently, he was self-employed as a shipping consultant and charity fundraiser and adviser. In 1965, he was appointed trustee of the

Joseph Strong Frazer Trust, and then chairman in 1981. The Frazer Trust gives donations to charities in England and Wales of approximately £400,000 a year. As a fundraiser, he helped several major charities, including arranging charitable events in the City, and has put on three charity jazz concerts in the Royal

Festival Hall. Present appointments include Trustee and Vice President of the Royal Merchant Navy School Foundation, Trustee of the Institute of Marine Engineers, Science and Technology Memorial Fund, Liveryman of the Worshipful Company of Shipwrights, Honorary Liveryman of the Company of World Traders, and Knight Commander and Bailiff of the Military and Hospitaller Order of St. Lazarus of Jerusalem.

His contact details are: The Clerk, The Worshipful Company of Fuellers, 26 Merrick Square, London SE1 4JB; Tel/Fax: 020 7234 0760; E-mail clerk@fuellers.co.uk

Arthur Puttock — an appreciation



Arthur Puttock

Members of the Fuellers' Company will no doubt be saddened to learn of the death of Arthur R Puttock, the Founder Clerk, who administered the organisation between 1981 and 1987. Arthur was a key figure in the

negotiations which eventually led to the formation of our Company.

During the Second World War, he served as a WO1 in REME with 2 Canadian Corps in Europe and was mentioned in dispatches. After the conflict, he joined the staff of Corral & Company, part of the Powell Duffryn Group. In 1961, Arthur was seconded to the South East Region of the Coal Merchants' Federation of Great Britain (CMP). In this position, he saw service on local National Coal Board and Solid Fuel Advisory Service promotional committees where he represented the interests of the retail trade. When the South Eastern Region of the CMF merged with the London Society of Coal Merchants in 1972, he became the first Secretary of the new enlarged organisation, a post he retained until his retirement in 1982.

During his service with the Society of Coal Merchants, he was encouraged, in 1974, by members of his Committee to

investigate the prospects of developing a more formal relationship between the City and "coal".

Arthur's initial approach was to Charles Stephenson Clarke (subsequently our Founder Master in 1984), a leading figure in both the coal trade and the Clothworkers' Company with which his family had connections for generations. At first, it was considered more appropriate to attempt to resurrect the original Charter of the Woodmongers and Coal Sellers which had a history dating back to the 14th Century, but which had been surrendered in 1667. Arthur and his colleagues were subsequently advised to petition as "The Fuellers", the colloquial name by which the Woodmongers and Coal Sellers had been known centuries earlier. Negotiations were eventually successful, leading to the formation of the Worshipful Company of Fuellers in 1984.

Arthur was also, for many years, closely associated with the sport of sea rowing. He was Secretary of a number of rowing associations before and after the last World War. For 31 years, he was Secretary and Treasurer of the Coast Amateur Rowing Association and President on two occasions. A member of the Council of the National Amateur Rowing Association and the Amateur Rowing Association for 40 years, he received the Queens Silver Jubilee Medal in 1977 for services to rowing.

Fuellers participate in transport debate — Cars kill Cities

The Royal Society of Arts (RSA), in collaboration with the Worshipful Company of Fuellers and the Worshipful Company of Carmen, recently organised a major transport debate, as part of the RSA's annual lecture programme. The well-attended event was held in the splendid surroundings of the Gibson Hall, Bishopsgate, in the City of London. The focus for the evening was city congestion and the quality of life, individual mobility, work patterns and the effective use of resources. The discussion covered, in particular, vehicles, energy, buildings and space.

The Chairman for the evening was Sir Alastair Morton, Past Chairman of the Strategic Rail Authority and the speakers were Professor John Adams, Professor of Geography at University College, London; Steven Norris, former Transport Minister and currently Chairman of the National Cycling Strategy Board; Professor David Garel Rhys, Director of the Centre for Automotive Industry Research, Cardiff Business School, and Peter Hall, Motoring Editor, Daily Telegraph.

The event proved to be an enjoyable occasion, with well argued presentations by the panel members, followed by an animated and often amusing question and answer session which allowed members of the audience to have their say. The final show of hands revealed that the listeners were equally divided between those for the car and those against.

Whilst there is no space within this report to give a detailed account of the evening's discussion, your correspondent noted several comments from both speakers and audience:

- Problems of on-road parking — what we want is a garage-building programme rather than a road building programme.
- Cars provide seamless transportation — public transport must replicate this convenience.
- Pedestrianisation of town centres does not lower the economic viability of commercial businesses.
- The motor car is the finest example of the concept of personal mobility.
- The car allows you to file your own flight plan.
- Cities, throughout history, have always been crowded and congested — is a car-free city worth its name?
- Forcing people onto public transport would have a negative effect on the arts — patrons would not attend the Royal Opera if they had to travel on public vehicles!

£20 million for off-shore wind technology

The UK Government is to provide £20 million in support of two new renewable energy projects. The funding is being split equally between off-shore windfarms near the coast of North Wales, operated by National Windpower, and Norfolk, operated by Powergen. The development by National Windpower will result in 30 wind turbines with a total capacity of up to 90 MW, providing electricity for 50,000 homes. The Powergen project off Norfolk will consist of 39 turbines with a total capacity of up to 80 MW, providing electricity for a further 50,000 homes. ■

New transmission network may bring renewable energy from Northern Scotland

Scottish and Southern Energy is to carry out an environmental impact study of the possible upgrading of the electricity transmission network from Beaulie in the North of Scotland to Denny in the central belt. An upgrade would enable Northern Scotland's huge renewable energy potential to be released to the population centres elsewhere in the UK. It would be designed to meet the demand for renewable energy projects which have been developed following the introduction of the Renewables Obligation and the Renewables Obligation Scotland earlier this year. ■

Methane-fired "energy park" comes on stream

A new methane-fired generating facility has been opened in West Yorkshire. The Alkane Energy Park, built on the site of the former Wheldale coal mine, can generate up to 10.6 MW of electricity from methane which has been escaping from the pit since it was abandoned in 1987. Alkane Energy, who run the Park, engineered a complete new seal for the mineshaft and have found a way to capture the gas and supply it to Scottish and Southern Energy plc for on-site electricity generation. ■

UK Government launches study on CO₂ capture and storage

A new investigation into reducing greenhouse gas emissions from fossil-fuel-fired power stations was recently launched by the Government. The study will look at the feasibility of a technique called carbon dioxide (CO₂) capture and storage. The technique prevents the CO₂ emissions from power stations being released into the atmosphere, by storing them underground in depleted oil and gas wells in the North Sea. The recent Performance and Innovation Unit energy review concluded that this method could reduce a coal-fired power station's CO₂ emissions by 80-90%. The study will look at:

- a The environmental impact of storing CO₂ underground and any risks of gases

- b the potential for CO₂ being used for Enhanced Oil Recovery; thus helping to maximise the benefits the UK can gain from the resource;
- c the need for further research and development to fully develop the technology;
- d the potential for collaboration with other countries, such as Norway and Denmark, who are interested in the technology;
- e the legal implications for permanently storing CO₂ under the seabed of the North Sea's depleted oil and gas wells, and
- f the economic cost of power generation as a result of capturing the CO₂ at the power station site. ■

Kintyre windfarm will generate 30 MW

What is said to be the UK's most efficient windfarm has been installed in Beinn an Tuire, Argyll. Just 46 wind turbines are expected to deliver an output of 30 MW, enough to supply electricity to 25,000 homes. Scottish Power's £21 million project is able to produce its power so efficiently because it is situated on the Kintyre peninsula where wind resources are amongst the best in Europe. The 40 m high towers sit on top of the highest hill in Kintyre, 454 m above sea level. The wind travels unimpeded, gathering speed, until it hits the 47 m dia blades. The wind farm is the first of what is hoped to be three windfarm developments in Argyll by Scottish Power. Two further developments, one of which one has already gained consent, are expected to bring local jobs, primarily in their construction. The local turbine factory in Machrihanish is expected to benefit. ■

New investment in cleaner coal technology

The Government recently gave consent for the construction of a flue-gas desulphurisation plant at the 2,000 MW Cottam Power Station, Nottinghamshire. This coal-fired facility is operated by Cottam Power, Limited. The desulphurisation plant will remove some 90% of the sulphur dioxide produced by the power station. The by-product is gypsum which finds extensive use in the building industry. It is expected that the plant will extend the life of the power station by about 15 years. ■

Further go-aheads for combined heat and power stations

Amongst recent consents for combined heat and power stations was one granted to Cleveland Potash, Limited for a gas-fired facility to be installed at the Boulby Mine at Saltburn. The station will supply all the company's heat and electricity requirements.

Elsewhere, Basell Polyolefins UK, Limited, are to build a gas-fired 65 MW station at their Carrington site at Urmston, Manchester. ■

New developments in North Sea oil recovery

Amongst recent initiatives in North Sea oil recovery are the start up of two new fields. One is the Halley Oil Field, operated by Talisman in the Central North Sea and the other is the Brigantine C and D fields operated by Shell in the Southern North Sea. The DTI has also given the go-ahead for the Helvellyn Field operated by ATP in the Southern North Sea. Hydrocarbons have also been discovered in the "Barbara" prospect operated by Dana, following test drilling. Dana, a UK company, is also preparing to drill in Ghana and Western Australia. A mix of oil and gas has been obtained from the Black Horse test well, operated by EnCana, a company which recently reviewed forecasts for the massive Buzzard discovery, with a billion barrels of oil in place. ■

New technology brings the North Sea's first-ever oilfield back to life

Two British companies are to redevelop Ardmore, the first-ever North Sea oilfield. Activity on Ardmore, formerly known as Argyll, came to an end in 1992 when operations became uneconomic and the field was decommissioned. It has been lying fallow ever since. Now Tuscan and Acorn, its new operators, have made use of the latest well technology, which will lead to a two-year project to recover 21 million barrels of oil that were previously unreachable. The reserves will be produced from three or four new high-angle wells. ■

Our Founder Master – a sad loss

As this edition of *The Fueller* was being prepared for press, we learned of the passing of Charles St George Stephenson Clarke, the first Master of our Company. When our organisation became a City Company without Livery in 1981, Charles was elected Master, and in 1984, when the Company gained its Livery status, he became Founder Master of the Worshipful Company of Fuellers. A full appreciation of Charles's contribution to the coal trade and an account of his efforts to restore the fortunes of our centuries-old institution will appear in the next edition of *The Fueller*.

Fuellers get to core of French nuclear policy

ONE of the highlights of this year's programme was a visit to the world's largest nuclear-powered station, Gravelines, not far from Dunkerque. A party of 14 Fuellers and guests made their way across the Channel on a wet and blustery day and headed North to the facility. A clue to the size of the station, sited on the coast, was given on the approach by the sight of not one, but six sets of high voltage power lines, each pylon in a typical French configuration resembling a cat's face, marching inland.

On arrival at Gravelines, operated by Electricite de France (EdF), the group was warmly greeted, fed and amply watered (with a thoughtful selection of local beverages) by the Station Manager, Christophe Geffray and his team.

Christophe then gave an introductory talk, explaining how EdF had taken a quite different path to the UK. Our own Tony Benn, as Energy Minister in 1968, rejected the compact American Pressurised Water Reactor (PWR) nuclear design, motivated perhaps by anti-American sentiments. He, instead, called for a British design of gas-cooled reactor which had a core many hundreds of times the size of a PWR's core, much more



The Fuellers' party photographed in the Gravelines nuclear power station (Photo by Julie Morgan)

costly to decommission, less flexible to operate, and with a different design (as it turned out) for every single station built. France, however, set aside any anti-American prejudice and set about an extended mass construction programme of standard Westinghouse (US) PWRs. This approach has turned out to be a success story which is the envy of the world. Even now, after a hiatus, more are once again planned, and they meet 81% of French energy generation requirements, with the surplus being exported to practically all the country's neighbours.

Although Gravelines is a coastal station, the French nuclear programme has differed from that of Britain, inasmuch that the authorities have not chosen to locate all their plants in such a position, whereas the UK has. The advantage of coastal positions is the availability of reliable supplies of cooling water. Gravelines is the world's largest site, generating some 5,400 MW (six units each of 900 MW). The flexibility of operation is breath-taking with fast response rates down to a minimum load of only 30%. Waste heat is used to run an enormous on-site fish farm producing more than 50% of all sea bass consumed in the world (including sea catches).

Christophe also touched on some labour market (in) flexibility issues in France, such as a short working week, which it is hoped the new Government will address, and on the issues that come with an ageing but dedicated workforce at the site. He was notably open about public relations and occasional mishaps.

The talk was inspiring, but nothing could prepare the party for what they were to see and experience on the tour. The Fuellers, after stripping off and being checked by a geiger counter, were kitted out with special clothing and radiation dosimeters. They were then permitted to go *inside the core containment building* of one of the PWRs. Such an invitation must be "as rare as hen's teeth"! The containment "dome", resembling that at the UK's only PWR, Sizewell B, has concrete and steel walls some 33 ft thick. Yet, on reaching the heart of its interior, the Fuellers were amazed at the

compactness of the reactor. This proved to be only about 12 ft across and 20 ft deep. In volume terms, this means the reactor could be fitted readily inside a small studio flat. This is astonishing if it is realised that the core is pumping out the equivalent of 120,000 hp. This is the same power output which would result from covering the entire area of Surrey with wind turbines, sited at maximum density, with no buildings allowed to stand in the way! The three boilers and the pressuriser vessel were hardly any bigger. Their size bears no relationship at all to the cavernous combustion chambers of a conventional power-station — not to mention the unloading bays, the multi-million-tonne coal heap, the conveyors, the mills, the chimney, etc.

The party were next shown the spent fuel pond. This was memorable for the sight of radiation-induced bright-blue radioluminescence in the pond. This phenomena only exists for a day or two after fresh used fuel is submerged in the facility — so very few people on the planet ever get to see it. The water was heavily dosed with borate salts, so the onlookers were quite safe. The Fuellers also witnessed the most amazing optical illusion, whereby the flat floor of the pond appeared to be grossly curved. As the visitors moved their heads around, the floor at the far end appeared to curve up out of the surface of the water, at each of the corners of the pond, in an extraordinary way. This is simply an enhancement of an optical illusion which would usually be hard to observe. The heightened distortion is caused by the extreme depth of the water — about 20 m — a totally still surface, and by the presence of a grid at the bottom.

The party were subsequently shown the control room with its mural mimic of the station, the significance of the illuminated displays being carefully explained.

Finally, the visitors were again royally fed and watered and all that was left was to thank Christophe and his team for what, for your correspondent, ranked as one of the very best days of his life!

Paul Mott



A section of the control room within the Gravelines nuclear power station operated by Electricite de France (Photo by Julie Morgan)

Cerenkov radiation explained

The bright blue glow from the spent fuel rods is Cerenkov radiation, caused by high energy particles exceeding the speed of light in water (but not the speed of light in a vacuum — superluminal signalling or travel is of course thought to be impossible, although imaginary particles in a parallel universe may be capable of this). The effect is analogous to a sonic boom, ie a particle exceeding the speed of sound in the medium which it is itself moving. It only exists for a short time as much of the fission products have a very short half life and are only present in really fresh "hot" spent fuel.

Summer is at best a memory

Summer at Wiseton Hall might now only be a memory, but its unlikely to fade for some time yet! The Master's At Home proved to be an exceptionally enjoyable occasion. The hospitality was generous, the entertainment spectacular and the weather glorious. Richard and Rosalind Budge provided a programme designed to appeal to both young and old alike. The arriving guests were welcomed with a champagne reception on the village

cricket ground — an extension to the lawns in front of the Hall. Music at the reception, and indeed throughout the day, was provided by the Hatfield Coalpower Colliery Band. After a buffet lunch in a marquee, which provided the opportunity to sample a pig roast, Fuellers were free to relive the days of their youth riding on a roundabout. Richard had organised the appearance of the Buxworth Steam Group with their 1893 steam gallopers,

together with swingboats and a smaller roundabout.

Towards the end of the afternoon, there was an unexpected attraction, with arrival of a biplane which entertained the guests with a spectacular display of aerobatics.

The accompanying photographs may remind Fuellers of that July day at Wiseton Hall



Michael Bryer Ash in conversation with Rosalind Budge, centre, and Lynn Port



Richard Budge, left, with Nick Ross and Colin Brinkman



Left to right, John Martins shares a word with Liz and Clifford Wright



The Hatfield Coalpower Colliery Band, with Wiseton Hall in the background



The cricket ground at Wiseton Hall provided the perfect setting for The Master's At Home



The 1893 steam gallopers proved to be a major attraction



Dennis Glew, Left in conversation with Simon Lee



Left to right, Joy Wilkinson chats to Maureen and Colin Brinkman



Photographed at the champagne reception were, left to right, Sue Dunleavy, Marjorie McCombe, Jane Ayre and David Bell



Left to right, John Martins, Roger Cloke, Gerry Yockney, Maureen Cloke, and Christine Yockney



Enjoying the sunshine were, left to right, Michael Bryer Ash, Lynn Port, David Port and Maureen Brinkman



Brian Harrison, left, with Mr and Mrs John Byrne

Grane — a high-viscosity newcomer to the Norwegian Shelf

Undeveloped oilfields with recoverable reserves in the region of 700 million barrels are not exactly commonplace. However, when the Grane field on the Norwegian shelf is fully operational, it is forecast that daily output may be as high as 214,000 barrels.

The Grane resource is far from typical of offshore fields in the region. Discovered in 1991 by Norsk Hydro, the oil is located in Tertiary sandstone, rather than in the more usual Jurassic formations. The oil is also very heavy and the reservoir pressures very low. As a result, its extraction has posed a major technical problem. Norsk Hydro has devoted a great deal of research to discover how to recover the maximum quantity of oil from the reservoir.

The challenge, on the face of it, might appear formidable. The ocean is 128 m deep and the oil formation lies 1,700 m below sea level. These conditions are not untypical of those encountered in oil recovery on the Norwegian shelf. The difficulty lies with the high viscosity of the oil itself. To bring the oil to the surface, the intention is to force natural gas into the reservoir through injection wells. The gas will be brought from the Heimdal Gas Centre over a distance of 50 km. This approach is deemed to be much more efficient than injecting water to achieve the same result. Furthermore, towards the end of the field's life, 20 years hence, it will be possible to recover the injected gas.

It is planned to drill 35 wells in the Grane field, of which 27 will produce oil. To ensure maximum production efficiency, the wells will be drilled to exactly 9 m above the oil and water interface in the reservoir. To achieve the necessary precision during drilling, Norsk Hydro, in conjunction with Schlumberger Oilfield Services, has developed what is known as the Ultra Deep Resistivity Tool, a device which has proved extremely effective when measuring the distance to the water/oil interface during a drilling operation.

The intention is to also conduct seismic investigation in parallel with the drilling operation, thereby exploring 300 to 400 m ahead of the drill bit.

Grane is the largest oil discovery that remains undeveloped on the Norwegian Shelf. It is a third of the size of the giant Osberg field, but more than twice as big as Brage. When the resource comes on stream in October, 2003, the oil will be transferred through a 212-km long pipeline to the Sture terminal, North of Bergen.

Fuellers visit HMS Sultan



This formal photograph taken during the visit to HMS Sultan includes The Master and his Lady, Mr and Mrs David Bell, Jane Ayre, Mr and Mrs Paul Mott and Nigel Draffin

During the summer, a party of Fuellers joined forces with representatives of several City Livery Companies, namely the Blacksmiths, Plumbers, Turners and Engineers (plus one Shipwright) for a visit to HMS Sultan, the Royal Navy's Marine and Air Training school at Gosport.

Commodore N P Latham and Lt Craig Simm welcomed the party. Our group was reminded that the Fuellers' original relationship was with HMS Daedalus, which has since been replaced by HMS Sultan on the new site. Cdr Latham explained that the present trainee population of around 1,500 could grow to 4,000; the MoD is considering amalgamating REME's (army engineers) training away from Hampshire into HMS Sultan, whilst amalgamating the Navy's air engineering training facility away from Sultan into the RAF's school in Shropshire. HMS Sultan has been leveraging its excellent facilities by offering training to industry via its "Flagship Training" enterprise, which now occupies some 190 of its staff. Naval training is also sold to students from places such as Oman and the "Old Commonwealth" nations.

This presentation was followed by a series of snapshot-visits, starting with the aircraft hanger where the party were fortunate enough to see, and enter, the first prototype £47 million Merlin, which is to replace the Sea King. Next was a visit to a Type 23 Frigate engineering simulator, with a replica of the ship's control room desk on which various engine/system faults could be simulated for diagnosis and response. An electro-hydraulic diagnostic set was shown, involving relays, valves, pumps and other actuators in a generic set-up analogous to systems in use on a variety of ships, on which over 100 faults could be introduced to test trainee artificers' thinking powers.

The party also visited facilities to learn of the maintenance of both small and large diesel and gas turbine engines, as well as other ship-borne equipment such as evaporator-condenser (water purification) sets. Aspects of hull maintenance and nuclear engineering were also seen to be taught, including the use of a reactor simulator.

An excellent lunch was followed by a trip across the water to HMS Victory at Portsmouth, where many fascinating anecdotes about the Battle of Trafalgar and Nelson's last moments were told.

The visit closed with tea, with all Livery Company members in agreement over the great fascination, pleasure and many insights they had gained from the visit. The Master of the Plumber's Company expressed the visitors' thanks to the many RN staff involved in the visit for their hospitality and patience in answering their many questions, wishing the facility well in its possible changes and in the development of Flagship Training.

Paul Mott

Fuellers' Website up and operational

After a great deal of hard work and commitment, the Fuellers' website is now operational and can be accessed on www.fuellers.co.uk. The content includes an introduction to the company; a list of the organisation's objectives; a history of the Company; the names of the Master, Wardens and members of the Court; an explanation of the elements of the Company's armorial bearings; military associations (HMS Sultan and 216 Squadron); details of the Charitable Trust Fund; a table listing future events; items of news, and the opportunity to download

the pages of "The Fueller".

The news pages, as of November, included items on the Fuellers' First Annual Golf Tournament at Wellingborough Golf Club; the Champagne to England event at Stamford — including photographs; pictures taken at The Masters' At Home garden party, and a photograph of the Masters, Wardens and their Ladies taken at the Installation Dinner.

The successful structuring of the website is due to the hard work and vision of Senior Warden, Doug Barrow, and several of his colleagues.