



An Association for Retired Professional Engineers

NEWSLETTER

Programme of events April to August 2004

Every Monday 10.30 am. Coffee at the Denton Lounge, Worthing Pier.

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|----------------------------|------------------|--|
| 7 th Apr. | Wednesday | Outing: 2.30 pm Tangmere Military Aviation Museum |
| 15 th Apr | Thursday | Coffee - at Spotted Cow, Angmering |
| 29 th Apr | Thursday | Coffee - with Partners at Beach Hotel, Worthing |
| 12 th May. | Wednesday | Outing: 2.00 pm Bluebell Railway and Sheffield Park Gardens, East Sussex. |
| 20 th May | Thursday | Coffee - at Spotted Cow, Angmering |
| 27 th May | Thursday | Coffee - with Partners at Beach Hotel, Worthing |
| 6 th Jun. | Sunday | Outing: 2.30 pm British Engineerium, Hove. |
| NEW ITEM | | |
| 9th June | Wednesday | Visit: 10.30 am Rolls Royce Motor Cars, Goodwood |
| 16 th Jun. | Wednesday | Outing: 2.30 pm Borde Hill Gardens, Haywards Heath. |
| 17 th Jun | Thursday | Coffee - at Spotted Cow, Angmering |
| 24 th Jun | Thursday | Coffee - with Partners at Highdown Towers, Worthing |
| 14 th Jul. | Wednesday | Outing: 2.30 pm Brooklands Museum |

15 th Jul.	Thursday	Coffee - at Spotted Cow, Angmering
29 th Jul.	Thursday	Coffee - with Partners at Highdown Towers, Worthing
19 th Aug.	Thursday	Coffee - at Spotted Cow, Angmering
26 th Aug	Thursday	Coffee - with Partners at Beach Hotel, Worthing

All Talks and Meetings will be commence at 2.30 pm and be held in the Chichester Room, Field Place, Worthing unless another venue or time is indicated.

Timings for visits and outings will be as printed in the detailed description of the activity and on the appropriate reply slips.

Coffee mornings commence at 10.30 a.m., except at The Beach, which is from 10.45 a.m

New Members

We welcome the following new members:

<p>2002 MARSHALL,P.W. IEng., MICE 60 Sea Avenue, The Sea Estate, Rustington,BN16 2DJ <i>Philip and Carol</i> (01903 776841) 56-68 London Transport.68-90 GLC/Thames Water/NRA- Flood defence design and i/c London tidal flood warning system and Thames Barrier operation.90-99 London underground various projects inc. Jubilee line extension <i>Interests:</i> Golf, Gardening, Investment Club.</p>	<p>2003 SIMMONS,W.L. MIEE., DMS. 14 Furze Close, Worthing, West Sussex BN13 3BJ <i>Bill and Marion</i> (01903 261617) 50-55 Student Apprentice SWEB. 56-58 National service-REME. 55-62 SWEB. 62-91 Distribution engineer plus 2 yrs. Chief Engineer's Dept. SEEBOARD. <i>Interests:</i> Gardening, Walking, Bowls.</p>
<p>2003 SELIGMAN, Sir PETER. CBE, FIMechE., BACantab. Churchview, The Street, Thakeham, West Sussex RH20 3EP <i>Peter</i> (01798 815 726) 36-42 Asst to MD of APV. 42-66 MD of APV. 66-78 Chairman of APV. <i>Interests:</i> Rugby, Squash, Skiing, Sailing, DIY.</p>	<p>2003 GIBSON, P. FIEE Thyme Cottage, Boxgrove, West Sussex PO18 0DX <i>Peter and Pat</i> Student Apprentice at Royal Dockyard Chatham. Research Scientist Mullard/Philips Research Labs, Redhill. Test System designer at MEC, Crawley. <i>Interest:</i> Computing, Music, Reading, TV, DIY.</p>
<p>2003 POUND, E.J. MIMechE 'Tranquility' 47 Hawthorn Rd, Broadwater, Worthing BN14 9LT <i>John and Mary</i> (01903 531153) 58-60 Asst. Maint Eng. 60-63 Port Eng. Jamaica. 63-66 Mtce Eng/Prod Mgr Michelin Tyres Stoke-on -Trent and NI. 66-82 Snr Mtce/Proj Eng ICI Wilton. 82-99 Proj Eng/Mtce Eng Supt, Process Eng Supt and Process Safety Mgr Celanese Canada Inc. Canada <i>Interests:</i> Gardening, DIY, Photography, Grandchildren, Theatre</p>	<p>2003 MACMILLAN, A.F.I. AMIMechE FIMC Lyndhurst, Meadow Way, West Horsley, Surrey. KT24 6LL <i>Alasdair and Sandra</i> (01483 283750) 62-68 Bristol Siddley Aero engines. 68-74 PA Management Consultants. 74-79 Director-Steel Distributors. 80-82 Director – Company producing robotic products. 85-89 MD – Company dealing with parking revenue equipment. 90-93 Director of larger, similar company. 93 - Independent Consultant in similar field. <i>Interests:</i> DIY, Motoring, Walking, National Trust.</p>
<p>2003 PAGE, L.R. BSc (Eng) (Lond), MICE. 30 Chelwood Ave, Goring-by Sea, Worthing BN12 4QP <i>Roy</i> (01903 242 133) 42-58 Brauthwaite & Co. 58-73 Rendel Palmer & Tritton Consulting Civil Engineers. 74-86 Parsons Brown & Newton/ Mott Macdonald. 87-91 Shoreham Port Authority. from 66 as resident Engineer for Consultants <i>Interests:</i> Philately, Bridge, CAB., Travelling.</p>	<p>2003 UNDERWOOD, J.H. MIEE 78 The Boulevard Worthing BN13 1LA <i>Jim and Marjorie</i> (01903 709 033) LEB Wimbledon. National service- Royal Engineers. BOAC Ground Crew. MOD Technical officer. MOD Project Officer. <i>Interests:</i> Rambling, Hill walking, Voluntary work.</p>
<p>2004 KEIR, R. C Eng MIEE 16 Shirley Close Rustington West Sussex BN16 2EG <i>Randall and Sue</i> (01903 785952) 65-69 Electrical Contracting – Installation and maintenance. 69-04 Ministry of Defence – all aspects of weapons systems. Chief Environment and Safety Officer for the Royal Navy. <i>Interests:</i> DIY, Gardening</p>	

RCEA Membership Detail for Mailing Addresses.

With the change in our title to “RCEA – An Association for Retired Professional Engineers”, our assumption in the past has been that everyone was a Chartered Engineer (CEng) to become a member. This is no longer valid, nor in fact has this always been true. In addition, the age of some of the Association’s records may mean some of the data relating to individual members qualifications is now incorrect. We therefore need to update these records to ensure that in future we correctly address post to individual members and that the data entered in the Members Directory is as up to date as possible when it is next issued. This is equally true for other designations such as Dr., Eur. Eng., etc, and for decorations, which may have been awarded since the membership data was prepared.

Below is a list of the current information held for each member. It would be appreciated if each member would therefore check the accuracy for his or her own entry. An extra column has been added for e-mail addresses and these have been included where known. If anything is incorrect, or you would like it changed in any way, can you please complete the reply slip at the end of this newsletter and forward it to the Hon. Secretary.

For the purposes of this exercise we have assumed that we still have your correct postal address. Can you please use the reply slip for this survey to correct any error you know of relating to your exact postal address.

Name	Designation	e-Mail Address
ADAM, A.T.	C.Eng MIEE	
AYLING, E.W.	C.Eng BSc(Eng) MIMechE MIEE	
BADBY, D.W	C.Eng ERD MICE MIStructE	
BARTLETT, B.B.	C.Eng FIEE	
BESLEY, E.T.	C.Eng BA MIEE MIED HonFIRSO	
BIRCH, M.J.	C.Eng MIMechE FInstPet DMS	
BRAKELL, J.D.	C.Eng MIMechE PENG FIQA	
BROWN, Eur.Ing. H.	C.Eng MIGasE FInstEnergy FIPlantE	
BRYAN-BROWN, D	C.Eng MIEE	
BUCKLAND, E.C	C.Eng FIEE, FinstMC,FRSA	
BUCKROYD, B	C.Eng MA,MIMechE	
BUTLER, S.M.	C.Eng FIMechE,MIMarE	
CALVERLEY, H.B.	C.Eng Bsc(Eng),FIMechE,FIEE	
CAREY, R.A.	C.Eng MIEE	
CHAPMAN	C.Eng MIEE	
CLEAVELY, A.A.	C.Eng MIStructE	

CLOUTING, D	C.Eng	BSc(Eng),FIEE	
COCKBURN, Eur.Ing. J.	C.Eng	AE,MIEE	
COLLARD, D.R.	C.Eng	FICE	
FIFE, D.R.	C.Eng	MIEE	
FOWLER, J.L.	C.Eng	MWeldI, MASQC,MIMechE	
FULLER, D.J.	C.Eng	MIEE	
GIBSON, C.S.	C.Eng	MIMechE	
GIBSON, P.J.	C.Eng	FIEE	
GRAY, C	C.Eng	BSc(Eng),MIMechE,ACGI	
GRIFFITHS, F.L.	C.Eng	MIEE	
HAMMOND,P	C.Eng	BSc(Eng), AMIEE	phammond@iee.org
HARRISON, C.	C.Eng	AMet,MIM	colin.harrison@tinyworld.co.uk
HARVEY, P.M.	C.Eng	BSc,FICE, FIWEM,ACGI	
HAYNES, B.	C.Eng	BSc,MIEE	
HURST, L.G.	C.Eng	MIMechE	
JARRETT, Eur.Ing. G.S.H.	C.Eng	BSc(Eng),FIEE	
JONES, D.A.	C.Eng	FIMechE,MIMarE	
KENDALL, G.F.	C.Eng	MIMechE	
KNIGHT, Eur.Ing. B.R.	C.Eng	FIGEM,MIMechE, MIMgt	
LAIRD, E.E.	C.Eng	MIMechE	
LANE, K.R.	C.Eng	DMS,MIEE	
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LITHERLAND, D.	C.Eng	MIMechE	
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LIVERSAGE, K.R.	C.Eng	DMS,FRAeS	
MACMILLAN, A.F.I.		AMIMechE,FIMC	
MARKWELL, E.	C.Eng	MIEE	
MARSHALL, P.W.	C.Eng	I Eng MICE	
MARSHALL, R.P.	C.Eng	BSc,FIMgt,DipCGLI	
MARTIN, R.G.	C.Eng	FIHT, MASCE,FICE	
MATHIAS, G.E.	C.Eng	MIEE	glyn.mathias@btinternet.com
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MORLEY, S.J.	C.Eng	BSc,FIEE,ACGI	
NASH, L.J.	C.Eng	BSc(Eng),ACGI,MIMechE,MIEE	
NEWBERRY, C.W.	C.Eng	BSc(Eng),MIMechE	
NEWMAN, R.A.A.	C.Eng	BSc(Eng),MIEE,FIQA	
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OLLEY, J.W.	C.Eng	MIMechE	
PAFFETT, J.A.H.	C.Eng	FRINA,HonFNI,FRSA,RCNC	
PAGE,L.R.	C.Eng	MICE	
PARSONS, R A.	C.Eng	MIEE	
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PRITCHARD, R.H.	C.Eng	MPhil, MIMechE,MIEE	
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RICHARDS, J.	C.Eng	BSc,MIEE,MInstP	
ROBINS, D.W.	C.Eng	BSc, MBA, MIMechE	
ROBINSON, P.	C.Eng	MA,MRAeS	
ROUBAUD, E.W.	C.Eng	MBE, MIEE	
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SEATON, R.C.	C.Eng	BMet, MIM	
SELIGMAN,P	C.Eng	CBE,FIMechE,BACantab	
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SHEFFIELD, R.D.	C.Eng	FICE	
SHIPMAN, R.H.	C.Eng	MInstE,MBE,MIMechE,MIGEM	
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SUTTON, P.H.	C.Eng	DFH,MIMechE,FIEE	
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TROTTER, E.B.	C.Eng	MIMechE	
TWORT, A.C.	C.Eng	FICE	
UNDERWOOD,J.H.		MIEE	
VICKERS, W.N.	C.Eng	MICE	
WARR, N.L	C.Eng	BSc,MIEE	
WEBB, D.E.	C.Eng	FIEE	
WHEELER, Eur.Ing.K.J.	C.Eng	CDipAF,MIMechE,FIMgt	
WHITAKER, A.S.	C.Eng	FICE,MIStructE	
WHITMELL, Ms.B.C.,	C.Eng	BSc,MIEE,MIMgt	
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WINFIELD, N.D.	C.Eng	MIMechE,MIMgt	
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WRIGHT, Ms.S.M.		IMMM	
Mrs Apted		Widow	
Mrs P. Bannister		Widow	
Mrs J. Blowers		Widow.	
Mrs L.A.E. Fosbrooke.		Widow	
Mrs.E A. Gardner		Widow	
Mrs U. Parry		Widow	
Mrs B. Rudd		Widow	

Brief Detail – Talks and Outings - for the remainder of the 2003 / 2004 Session

Outing

Wednesday 7th April 2004, Tangmere Military Aviation Museum

The Museum, open since 1982, tells the story of military Flying from the earliest days to the present time with special emphasis on the Royal Air Force at Tangmere and the Air War over Southern England from 1939 to 1945.

It is divided into four halls. You will find in the Museum, an intimate atmosphere lacking in other museums of this kind, a fact much remarked on by visitors.

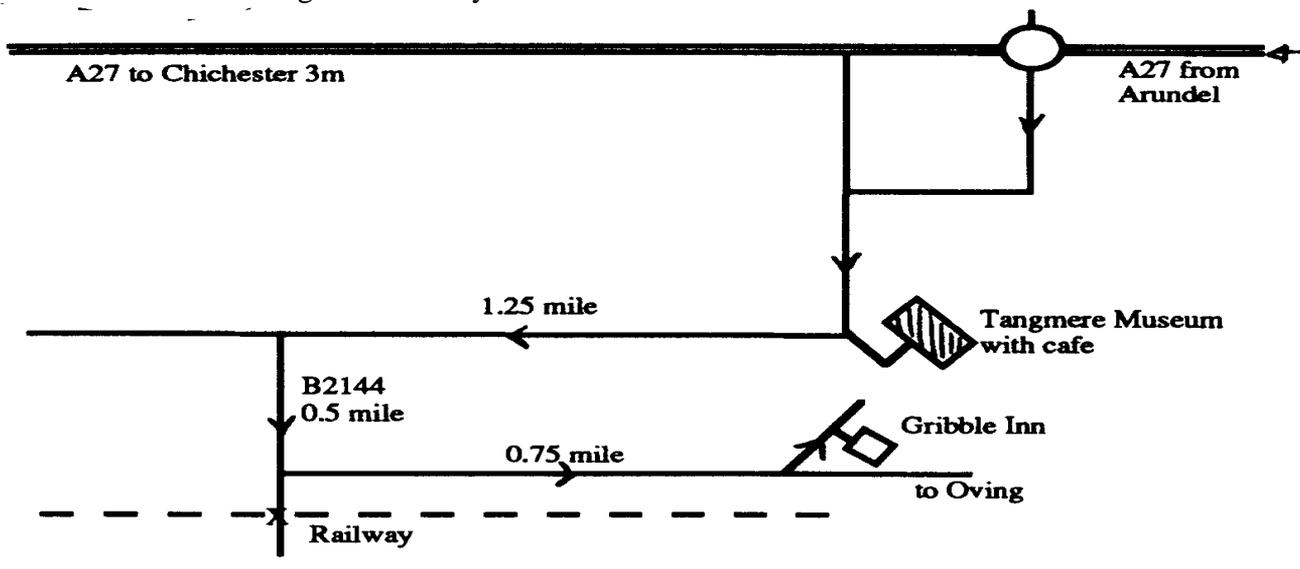
We will have a fully guided tour of between 1 and 1.5 hours, starting at 14.30. The cost of the visit will be £3.60 per person.

For those who may wish to gather for lunch, the Gribble Inn at Oving is able to provide for us. Directions for the Gribble Inn are shown with the reply slips at the end of this newsletter.

Can you please indicate whether you will join the party for lunch at the Gribble Inn so that an advanced booking for tables can be made. Suggest lunchtime meeting at 12.30 pm.

Directions.

Tangmere Military Aviation Museum and Gribble Inn.



Outing

Wednesday 12 May 2004 2.00pm Sheffield Park, Sussex. Bluebell Railway and Sheffield Park Garden.

An outing to the famous Bluebell Railway, including a return trip to Kingscote with a guided tour and in addition a visit to Sheffield Park Garden. **All** group visitors are requested to meet at the **Sheffield Park Station at 2.00pm** to receive tickets. We will then proceed to the 2.15pm train or Sheffield Park Garden as required. The train will return by 3.30pm. and the tour will take place at approx. 4.00pm. The station includes catering facilities for those who wish to take lunch in advance. The reply slip requests members to indicate if they will be taking advantage of this facility. This is to provide details of numbers only. Payment will need to be made individually after your meal.

This outing includes a visit to the nearby Sheffield Park Garden. This is a 120-acre garden, laid out by 'Capability' Brown, with four large lakes, reflecting the exquisite layout planting of trees and shrubs. There are catering facilities on site. For those wishing to make this visit on a separate occasion, unused tickets are valid for 12 months.

Directions

For those travelling from the west, take the A27 to the start of the Lewes by-pass. At that roundabout, take the first exit towards Lewes town centre. At approx. 1 mile there are cross roads with traffic lights and Lewes prison on the left. Turn left on to the A275. Stay on this road and travel through Cooksbridge and Chailey. From the roundabout at North Chailey, the Bluebell Railway is approx. 1 1/2 miles. Sheffield Park station is to the left and the car park to the right. The road here is winding and not too wide so take care crossing it, also if walking to Sheffield Park Garden, which is approx. 400 metres along the road and on the right.

Cost

The cost per person (in parties over 20) is £10-50. For National Trust and Royal Horticultural Society members the cost is £7-00. Please note that for NT and RHS members, admission to Sheffield Park Garden is by use of your membership card, valid on the day of use.

All wishing to join this outing are requested to complete the reply slip at the end of this Newsletter.

Visit

Wednesday, 10.30 am, 9th June 2004 Goodwood, Sussex. Rolls Royce Ltd.

This is an **extra** item for this current session. A visit had been proposed for March but could not be arranged at that time by Rolls Royce. They have, however, now offered a visit to suit their schedule in June.

The group will be limited to **20** places, so it must be – places to be reserved on a first come basis. (If the visit is successful we will try to arrange another in the near future.)

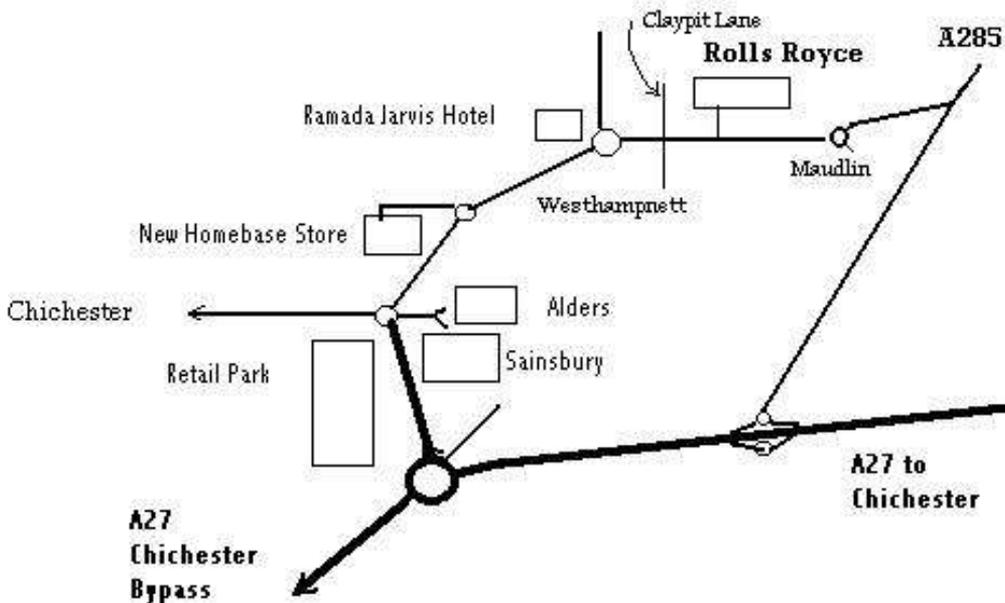
To apply for a place please complete the application slip at the end of this newsletter. You will be informed if you are among the first **20** applications.

The group have been requested to report to the Main Reception Building in The Drive, at Westhampnett, near Goodwood at 10.30 am on the morning of the visit. Car Parking is very limited at the site (about 16 places only) and therefore we have been asked to arrange a car share transport system. Can you please indicate on your application slip if you wish to take your car and how many spare seats you will have. We will inform you at the time we confirm your place on the visitors list, who needs a lift and arrange a suitable pick up point.

Rolls Royce need to know in advance the names of all visitors, can you please indicate on the reply slip that you are prepared to have your name released.

Directions:

Follow A 27 towards Chichester to retail park at start of Chichester bypass. Turn right at roundabout past retail park on left. Continue straight across next three roundabouts. Rolls Royce 200 yards on the left.



Outing

SUNDAY, 6 June 2004 2-30pm, British Engineerium, Hove, Sussex.

An outing to a working exhibition of magnificent steam engines set in a restored Victorian water pumping station. This date is chosen since the Engineerium is 'in steam' on the first Sunday in the month. The visit will include a guided tour of the steam engines in operation, some of the engine houses, boiler rooms and restoration workshops. Please note that the ground floor, which houses the main part of the exhibition, is accessible to disabled visitors, but not the gallery, access to which is by stairs.

The Engineerium has pleasant adjoining gardens.

Directions:

For those travelling east on the A27, leave it at the A2038. This is achieved by taking the last exit at the first roundabout, going over the A27 and at the second roundabout, taking the third exit, the A2038, King George VI Avenue. In about $\frac{3}{4}$ mile, at the foot of the hill, bear left on to the A2023, Neville Road. In about $\frac{1}{2}$ mile, where the road takes a sharp right bend, carry straight on into the Droveaway, with the Engineerium on the left. There are clear yellow and black signs for the Engineerium in this area. There is ample car parking in the Engineerium grounds.

Cost

The cost of the outing is £4-50 per person.

All wishing to join this outing are requested to fill in the reply slip at the end of this Newsletter.

Outing

Wednesday 16th June 2004, 2.30pm. Borde Hill Gardens, near Haywards Heath.

An outing to the gardens and woodlands walks, including a one hour guided tour in the spectacular Borde Hill parkland. Come and enjoy these glorious gardens and the beautiful Sussex countryside, just about an hour away from Worthing. We meet at the entrance area to the gardens at 2.30 pm. For those who wish, there is the Lavender Tea Room where Lunches or Afternoon Tea is served as well as Jeremy's Restaurant (mentioned in the good

food guide), but reservations are obligatory and this restaurant is very expensive - Tel 01444 441 102.

Cost

The visit inclusive of the Garden tour will be £6.50 per person.

All wishing to join this outing are requested to fill in the reply slip at the end of this Newsletter.

Directions

Borde Hill Gardens are to the north of Haywards Heath towards Balcombe and Gatwick. The gardens are clearly signed from the major routes into Haywards Heath.

Outing

Wednesday, 14 July 2004, 2-30pm, Brooklands, Byfleet, Surrey.

An outing to Brooklands Museum, the birthplace of British Motorsport and Aviation. The grounds include part of the original racetrack made famous by Malcolm Campbell and include examples of racing cars in the Malcolm Campbell Shed. The aviation side of Brooklands is associated with the work of Sir Barnes Wallis and a Wellington bomber is displayed. Refreshments are available. This outing includes a guided tour of the Museum.

Late news! Brooklands is to receive a Concorde in May, which will be reassembled and displayed. At the time of our visit, the Concorde should be on display, though work may be still in progress.

Directions.

Travel north on the M23 and join the M25 and travel west. Leave the M25 at the A3, junction 10. Take the last exit and travel on the A3 in the direction of **London**. In approx. ½ mile, at the roundabout, take the first exit, A245. In approx. 1/2 mile, at the roundabout, take the right exit, B374. Proceed over the first roundabout and follow the signs to the Museum, which is on the left.

Cost

The cost of the outing will be £5-50 per person. All wishing to join this outing are requested to fill in the reply slip at the end of this Newsletter.

2004/5 Programme of Events

There have been a number of suggestions for activities to include in the next programme. A selection of those being considered for inclusion is listed below. **There is still an urgent need for member's papers.** Any volunteer to present a paper would be appreciated.

Possibilities

- Talk, Steam Power by Ken Wheeler.
- Visit / Outing, Gatwick Aviation Museum.
- Royal Navy Presentation Team.
- Outing, Skittles with lunch. Two alternatives
 - The Black Horse, Findon
 - The Bull, Henfield,
- Visit / Outing, Harvey's Brewery, Lewes
- Tour of Brighton Rail Station.
- Outing, Wakehurst Place.
- Outing, Windmill at Shipley. This would be a Sunday visit.
- Outing, Staunton Country Park.
- Visit, Ceres Power Ltd., Crawley
- Visit / Outing, Kate's Cakes Ltd., Ashington.
- Visit, Tesla Engineering Ltd., Storrington.
- Visit, Thales Simulation Ltd., Crawley.
- Talk, Sentinel Steam Engine, Jim Hatfield.
- Talk on Steam Railways of Cuba, Dave Stallard.

Norwegian Holiday

Woods Travel, Bognor Regis – Special offer to RCEA Members

One of the holidays on offer from Woods Travel, Bognor Regis, this year is a holiday to Norway. They believe this may be of interest to members of the RCEA because of our engineering background. This holiday is being offered at a special price to Association Members and details are attached to the end of this newsletter.

(Since this is an unusual attachment to one of our newsletters, Woods Travel has agreed to pay the postage cost for this edition of the newsletter.)

REPORTS

Talk

Tuesday 13 January 2004 2.30 pm Field Place, Durrington, Worthing.

Ships Hulls since Cheops.

This talk was given by James Paffett, one of our members, who spent his career in naval architecture and was able to present a thoroughly knowledgeable account of the subject. The talk was accompanied by numerous overhead projections, many of which were sketches produced by the speaker, as were the model hull sections on display.

The theme was the development of ships hulls over broadly 5000 years, from the Egyptians, ruled by Cheops in approx. 2500BC, to the present time. It was noted that for most of this time, materials used were mainly natural and relatively recently, man made. The features and limitations of design and performance affected by the materials used were described.

The basic requirements of the hull were stated; that the ship would float, and overcome tendencies to hog, distort upwards, or sag, distort downwards. Stone age materials, timber, and tools, axes, were noted in the carving of hulls from solid wood.

When joints were required, they were made by boring holes and lashing with roots or sinew and caulking with bitumen.

The Egyptians used dovetail joints to prevent planks sliding laterally. Longitudinal joints were also required due to the short length cedar wood used. Wooden pegs and pins, together with cord, were also employed. The Greeks used male/female joints and a system of securing a rope from stem to stern, then twisting it, to provide uniform compressive stresses along the length of the ship.

By 400AD, the tall pines of Scandinavia allowed for longer lengths of planking and longer ships. The use of iron nails and copper washers allowed hulls to be clinker built or overlapped. Over time, ships grew in size, decks were developed, forecastles and after castles were included.

By the 18th century, sawn oak was used for hulls, carvel built or planks laid side by side. Ships were initially designed on paper; wooden and metal dowels were used in construction. A basic weakness remained, that of planks being able to slide, despite caulking. This caused leakage, which with fire and fouling, was the main destroyer of ships. Diagonal framing

cured planks from sliding and copper sheathing reduced fouling. Wooden ships had reached a maximum size of 300-foot length and 3000 tons displacement. There was an increasing shortage of timber for hulls.

The 19th century saw an increase in world trade, with a demand for ships that required materials without the limitations noted above. The industrial revolution had produced iron, and initially, wrought iron was used for ships. This allowed hulls to increase to 600 feet length and include watertight bulkheads. The disadvantages of wrought iron were the small plate size, variable quality, buckling in compression, its effect on magnetic compasses, fouling and corrosion. By the mid 19th century, wrought iron was being replaced by mild steel, which was slag free, of larger plate size and of more consistent quality.

The use of metal for hulls required different joining techniques. Mild steel rivets were used and in the 1930s welding was introduced. During World War II, a serious problem occurred with all-welded Liberty Ships. These were mass produced cargo ships developed for the transport of war material across the Atlantic Ocean. At low temperature, such as the wintry North Atlantic, serious hull cracks developed which, at worst, caused rapid sinking. Investigation revealed brittle fracture and it was shown that the fracture behaviour of mild steel was affected by temperature which itself was affected by steel composition. This was adjusted to lower the ductile/brittle transition temperature. Important tests associated with this subject were the Charpy impact test and the Robertson steel plate brittleness test, described in the talk.

The latter part of the 20th century saw materials development applied to hulls, including high tensile steels, which allowed thickness reduction, aluminium alloys, and non-metallic materials allowing greater design freedom.

The talk concluded with a brief summary, followed by a well-deserved vote of thanks from Colin Pilling.

(Contributed by Colin Harrison)

Visit

Tuesday 20 January 2004 2.30 pm University of Surrey, Guildford.

Small Satellite Engineering.

The Space Centre is home to Surrey Satellite Technology Limited (SSTL), a spin-off company formed by the University of Surrey in 1985 to commercially exploit small satellites developments at the University.

Today, the Centre houses a thriving academic group undertaking research into small satellite technologies alongside postgraduate teaching, and the commercial company, SSTL, which employs 160 professional staff working on the design and build of small satellites for a burgeoning international customer base.

Having pioneered the development of small satellites and launched some 23 missions in 22 years, the Centre remains at the forefront of small satellite technology, continuing to develop a range of ground breaking satellite missions for world-wide customers and commercial service providers. This year, SSTL won the European Space Agency contract to build the first test satellite for the European Galileo navigation system - Europe's greatest adventure into space and SSTL's first venture beyond Low Earth Orbit.

A tour of the Space Centre will provide an opportunity to visit the Mission Control Centre, from where all Surrey's current operational missions are monitored. It is difficult to predict exactly what will be on view in the clean room but the early structure for the Galileo satellite, GSTB-V2/A may be underway by then. There are also life-size models of at least two Surrey missions, plus scaled-down versions of several others. A fully autonomous ground station is incorporated within the Space Centre.

Peter Hurley, who was to have given the December talk on the Space Centre, will conduct the tour and has promised a detailed tour of the facility guided by engineers.

(Contributed by Colin Harrison)

Outing

Tuesday 3 February 2004 2.00 pm Glyndebourne, Lewes, E. Sussex.

Glyndebourne Opera House.

52 members and guests gathered at Glyndebourne Opera House, 36 of us having earlier enjoyed lunch at the nearby Trevor Arms. As the weather was fine, we were able to stroll through the gardens at Glyndebourne, prior to the tour. Carmel Gregg, Deputy House Manager, who explained the programme for the visit, greeted the party.

We then went first on stage, which not only provided a view of the auditorium, but also the even larger back stage area. The present Opera House is 10 years old and the benefits of modern technology were evident. The orchestra pit, extending the stage width, was set on a lift and could be raised or lowered depending on the type of performance to be given. The old type of centre stage prompt box had been replaced by an off-stage control centre operated by the Deputy Stage Manager, and linked to the conductor, lighting dept., artists etc. by TV monitors. Members of our party took full advantage of the photography allowed during the tour. Present was scenery from the latest production, *Die Fledermaus*. Features of the House were noted, including the computer controlled lighting area and the control area for recording and live TV performance.

The immediate back stage area was large, containing the alternative sets required for scene changes and the necessary equipment, including 74 hanging bars, which could swiftly raise and move the massive scenery. Beyond were two rehearsal areas, each of full stage size and fully soundproofed, allowing their use at any time. A typical day was described, with rehearsals am and pm, the performance, then night crew activity preparing scenery for the next day.

A few facts concerning the present day activity were given. Planning a season starts three years in advance. A typical year will contain two new operas and four revivals. Preparation of scenery, costumes, and rehearsals take place from Jan. to April. Glyndebourne is unusual in insisting on lengthy rehearsal time, where emphasis is on acting, including language coaching, in addition to singing. The Festival season is from May to August. The Touring Opera then takes over with similar preparation and a brief season in October before touring the UK up to Christmas. This Opera advances the career of younger singers. The major sets are constructed off-site and similarly stored after use. They can be hired or sold to other opera houses and re-used at revivals. Smaller scenery, props, wigs and costumes are

made on-site. Total staff is approx 500, of which 100 are permanent, including 25-stage crew.

A brief walk outside was made and the use of outbuildings and transport was described. The tour proceeded to the main dressing rooms and then to the upper circle. From this comfortable vantage, details of the House were given. Designed by Michael Hopkins, it contains 4 million bricks, which match the old Opera House, some of which remains. The auditorium, which takes an audience of 1200, puts emphasis on acoustics. The visual feature is wood, reclaimed pine panels, shaped acoustically, seats in white oak with the air conditioning flowing through them and slatted so that when not occupied for a performance, the underside adds to the acoustics.

The party then went down to the Green Room or artists rest area. This was large, comfortable with views of the lake and gardens. Set out were costumed models, a model set of Die Fledermaus and many photographs. A brief history of the development of the Opera Houses on the site, owned by the Christie family, was given. The previous opera house was opened in 1934, seating 850 and replaced with the present structure in 1994. Some of the disciplines, introduced by the first Director, Carl Ebert, are noted above. The Opera has long been famous for its Mozart performances, but continues to develop its repertoire and last year performed Wagner for the first time. It is self-funding, apart from the Touring Opera, which receives Arts Council grants. From being a restricted membership audience, it now includes an increasing proportion of the general public, with much lower prices for the Touring Opera.

At the conclusion of the tour, Carmel Gregg received a well-earned vote of thanks and we retired to the Mildmay restaurant for tea, and then visited the shop and information office. A most interesting visit.

(Contributed by Colin Harrison)



Is this the new Chorus Line for the Opera?

Talk

**Tuesday 10 February 2004 2.30 pm Field Place, Durrington, Worthing
Royal Armouries, Fort Nelson.**

Nicholas Hall, Keeper at Fort Nelson, Portsmouth, spoke to a well-attended meeting, some of whom had visited Fort Nelson with the RCEA in 2002. Fort Nelson lies above Portsmouth, commanding a wide view of the surrounding countryside. Its origin dates from mid Victorian times, when France was seen as a serious threat to England, which has a history of invasion and threat along its south coast. A Royal Inquiry recommended a series of fortifications in this area and the Government of Lord Palmerston authorised their construction, Fort Nelson was one of these. Its name is taken from the nearby monument to Nelson, which still stands in an adjacent field.

Planning followed the strategy that invasion would likely be along the south coast and Portsmouth then attacked from inland, Fort Nelson therefore faces inland. Its design was based on the numerous continental defensive structures, being roughly pentagonal in shape, with massive gunnery for attacking the enemy at range and moats with mortars and enfilading firepower for close range defence. The distance between each such defensive strong point was such that the cover provided by their guns was continuous. The guns used reflected the rapid technical developments taking place in armaments in this period. The Fort was commanded by Regular Army Officers and manned by artillery volunteers.

When the above threat did not materialise, the Fort was used initially for manoeuvres, and as a transit camp in World War I. During World War II it was used as the area major magazine, and had anti-aircraft defences. Following World War II, the Fort was not used and became derelict. The Ministry of Defence eventually sold the site to Hampshire County Council who commenced restoration. Our speaker, Nicholas Hall, supervised the restoration, set up and is Keeper of the present museum.

In the 1990s, new impetus and focus was provided by the Royal Armouries, then housed and overcrowded in the Tower of London, with many exhibits in storage. Light armour was sent to a new Centre in Leeds and the heavy armour including guns was sent to Fort Nelson, which proved an ideal setting. This allowed the correct guns to be displayed in the embrasures as well as the display of many historic guns and mortars and ordnance in both indoor galleries and outdoors. Some guns are fired on public occasions.

Fort Nelson has been open to the public for a number of years and receives upwards of 80,000 visitors annually. Apart from the exhibits above, in keeping with modern trends, it has diversified and includes conferences, displays and even weddings. For those interested in further detail the web site is www.armouries.org.uk

Nicholas Hall showed himself as an enthusiastic and knowledgeable speaker and received a well-deserved vote of thanks.

(Contributed by Colin Harrison)

Talk

Tuesday 9 March 2004 2.30 pm Field Place, Durrington, Worthing.

New Trains for the South East

Philip Dee, Accounts Manager with Angel Trains gave a topical talk to a well-attended meeting of members. Angel Trains, based at Waterloo, was formed in 1994 to provide passenger rolling stock to train operators. They lease such stock throughout the UK and also on the continent of Europe.

In our part of the UK, new trains are being introduced in the South East, South Central and Essex areas, replacing rolling stock, such as the slam door Mark I trains, some up to 40

years old. This activity also contributes in meeting the significant increase in passenger rail traffic.

A brief overview of the new rolling stock was given, including pictures of the various types. In construction, bodysells are monocoque, stronger than earlier bodies, which were built upwards from a base chassis. Much use is made of extruded aluminium sections, assembled by welding and bolting. Steel is used for the underframe areas, which include modern bogies, air suspension, producing reduced track forces, all designed to provide a comfortable ride. The coach ends are designed to absorb impact and prevent override upon collision.

In the saloon areas, emphasis is given to safety and comfort, including the use of plastics, flame retardant materials, brighter stronger colours, visual and audible passenger information, air conditioning, and provision for disabled passengers. The driver's cabs are ergonomically designed, including computer screens and intercoms.

Before commissioning, new stock is tested, statically and dynamically to ensure compliance with relevant standards, legislation and health and safety regulations.

Climatic testing cycles coaches between -50 and +50 degrees Celsius. Test tracks in the UK and Germany also used.

Following the interval, a lively question and answer session took place, as could be expected from our members. Subjects raised included insufficient power for the trains, seating comfort, the need for widespread use of 12 coach trains, responsibility for maintenance of rolling stock, replacement of the communication cord, and the effectiveness of override provisions.

Richard Norton gave a well-deserved vote of thanks to the speaker.

(Contributed by Colin Harrison)

Northbrook College – Lunch

Thursday 18th March 2004 – Annual Lunch at Northbrook College, Worthing.

52 members and their guests attended this function and enjoyed a well-presented and cooked meal. Members and guests met at mid-day for a pre-lunch drink and departed mid

afternoon after a socially enjoyable occasion. Glyn Mathias, our President, closed the day with a vote of thanks to the staff and students at the College, preceded by a few words of thanks from Peggy Bannister for the sympathy expressed to her by members and friends at the recent loss of her husband, Lewis.

Volunteers required:

Newsletter Reports

To reduce the workload on one or two members who regularly contribute to this newsletter, it would be appreciated if other members could volunteer to produce short reports on the various activities of the RCEA. These reports **need not** be in a typed form and only need to be relatively short accounts of the visit, outing or talk. In this way all of our members can be kept informed of these events and hopefully encouraged to attend future ones.

Can any member who would be prepared to assist on a one off basis or as a regular contributor, please make contact with any committee member.

Reply Slips: -

Reply Slip – Qualifications, decorations, etc.

To:- **Mr C Pilling, Hon. Secretary, RCEA**
84, Marine Crescent,
Goring by Sea,
Worthing BN12 4FH

Can you please revise the data you have relating to my qualifications etc. in your database as set out below:

Title	Initials	Surname	Decorations	Qualifications and Designations
Dr / Eur.Eng	A B	Green	OBE	B Sc DMS C Eng MIEE MICE etc

e-Mail Address

Mailing Address

Signed _____ RCEA Member



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PAGE

To: Colin Harrison, 41 Cluny Street, Lewes, E. Sussex BN7 1LN

I/we wish to join the outing on **Wednesday 7th April 2004**, to the Tangmere Military Aviation Museum.

Full name.....(Block capitals)

Address.....
.....
.....

Phone no.....

Applications by 31st March 2004

I enclose a cheque made payable to RCEA forat **£ 3.60** per person.

I/we wish to join members at the Gribble Inn for lunch at 12.30 pm. Please indicate **No....**

To Colin Harrison, 41 Cluny Street, Lewes, E. Sussex BN7 1LN.

I/We wish to participate in the joint visit to the Bluebell Railway and Sheffield Park Garden on Wed. 12 May 2004. Outing starts at **2-00pm** prompt, (**Not 2-30pm as previously indicated**), at the Sheffield Park Station

I enclose my cheque for £....., payable to R.C.E.A., being **£10-50** per person, or **£7-00** per person, for National Trust or Royal Horticultural Society Members.

Full name.....(Block capitals) Phone No.....

Address
.....
.....

Please indicate if you will be taking lunch at Sheffield Park Station. **NO/YES.**

Applications by 15th April 2004.

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Page

**To: B. Buckroyd, 6 Fosters Close, East Preston, BN16 2TL
Tel: 01903 784926**

Please reserve a place for me for the visit to Rolls Royce Motor Cars, Goodwood.
10.30 am Wednesday 10th June 2004

NAME(Block capitals) Phone No.....
Address
.....
.....

I can offer seats in my car to assist with transport.

I accept my name can be released to RR before the visit.

YES

Applications at the latest by 1st May 2004.

To: Colin Harrison, 41 Cluny Street, Lewes, E. Sussex BN7 1LN

I/we wish to join the outing to the British Engineerium, Hove, at 2.30pm on Sunday 6th June 2004.

Full name.....(Block capitals)
Address.....
.....
.....

Phone no..... **Applications by 30th April 2004.**

I enclose a cheque made payable to RCEA forat £4-50 per person.

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Page

**To: Hermann Rummeli,
3 Woodbridge Park, East Preston, Littlehampton. BN16 1NL Tel. 01903 770264**

I/we wish to join the outing to Borde Hill Gardens, Haywards Heath.at 2.30pm on
Wednesday the 16th June 2004

NAME(Block capitals) Phone No.....

Address

.....

.....

I enclose a cheque made payable to RCEA forat **£ 6.50** per person.

Applications at the latest by Thursday the 20th May 2004.

**To: Colin Harrison,
41 Cluny Street, Lewes, E. Sussex BN7 1LN**

I/We wish to join the outing to the Brooklands Museum, Byfleet, Surrey at 2.30 pm on
Wednesday the 14th July 2004.

NAME(Block capitals) Phone No.....

Address

.....

.....

I enclose a cheque made payable to RCEA forat **£ 5.50** per person.

I can offer seats in my car .

Applications at the latest by 31st May 2004.
