RCEA
(SUSSEX)

An Association for Retired Professional Engineers

NEWSLETTER December 2007

Happy Christmas and Best Wishes for the New Year

PROGRAMME OF EVENTS 2008

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

8th Jan	Tuesday.	**Talk.** "Oil Industry Disaster Planning." Speaker Malcolm Phillips.
16th Jan	Wednesday.	**Visit.** Repeat * 2nd Oct. 15.00 at Gatwick Mail Centre, James Watt Way, Crawley
17th Jan	Thursday	Coffee - at Spotted Cow, Angmering
31st Jan	Thursday	Coffee - with Partners at Beach Hotel, Worthing
12th Feb	Tuesday	**Talk.** "Safety Devices in Nuclear Weapons."

Speaker Jim Buckland

21st Feb	Thursday	Coffee - at Spotted Cow, Angmering
28th Feb	Thursday	Coffee - with Partners at Beach Hotel, Worthing
11th Mar	Tuesday	**Talk.** Prospects for Fusion Power. Speaker from UKEA.
13th Mar	Thursday	**Lunch** at Northbrook College, Worthing**.**
18th Mar	Tuesday	**Visit.** HPC Ltd. Burgess Hill. Tour of this Precision Engineering Facility
20th Mar	Thursday	Coffee - at Spotted Cow, Angmering
27th Mar	Thursday	Coffee - with Partners at Beach Hotel, Worthing
8th Apr	Tuesday	**Visit** HDM Sealless Pumps Ltd, Eastbourne
17thApr	Thursday	Coffee - at Spotted Cow, Angmering
22nd Apr	Tuesday	**Outing.** Tour of Festival Theatre, Chichester.
25th Apr	Thursday	Coffee - with Partners at Beach Hotel, Worthing
15th May	Thursday	Coffee - at Spotted Cow, Angmering
20th May	Tuesday	**Outing.** Lancing College Chapel. Guided tour and short organ recital.
29th May	Thursday	Coffee - with Partners at Beach Hotel, Worthing
17th Jun	Tuesday	**Outing.** Guided Tour of Parham House.
19th Jun	Thursday	Coffee - at Spotted Cow, Angmering

26th Jun	Thursday	Coffee - with Partners at Highdown Hotel, Worthing
9th Jul tbc	Wednesday	**Outing.** Tour of Chichester Harbour
17th Jul	Thursday	Coffee - at Spotted Cow, Angmering
31st Jul	Thursday	Coffee - with Partners at Beach Hotel, Worthing
21st Aug	Thursday	Coffee - at Spotted Cow, Angmering
28th Aug	Thursday	Coffee - with Partners at Beach Hotel, Worthing

All Talks and Meetings will 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.

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

Please Note:

Attendance at the Beach Hotel Coffee Morning get together will in future cost £2.25 per person for all members and guests to cover the Hotel charge for the coffee and use of their facilities

Membership

New members, can you please check your detail below, this is the entry that will appear in the next RCEA handbook. If you would like to have it changed please contact Colin Pilling, Hon. Secretary.

2007 WALDER C J FIMechE
5 Glebe Close Southwick Brighton BN42 4TF *Cliff*
(01273 592411)
cwalder@dsl.pipex.com
!939 **Ricardo** Assistant Tester then Client Liaison Engineer.
1968 Director overseas clients.
1973 General Manager
Interests: Gardening, Theatre, Photography DIY

2007 BINKS, M B FSE PEng FRSH FIEE FIET MIOSH
10 Selkirk Close Worthing BN13 1PR
Michael and Joan (01903 241245)
50-83 British Rail – Civil Engineers dept at various locations.
Permanent way design installation, New Works design and Construction and Safety engineering. Permanent way Safety Engineer for Southern Region

Interests: Music, TA – Royal Engineers, Probus, Model Railways

2007 BATTERLEY, P MA CEng FIMechE FIEE FIChemE
8 Bluecoat Pond, Christs Hospital, Horsham RH13 0NW
Peter (01403 275331)
46-47 Lecturer Royal Naval College. 47-56. ICI Project Engineer.
56-60 UKAEA Chief Engineer Windscale 60-65 CJB Eng. Director.
65-75 Mars Ltd Chief Engineer
75-80 Mars Inc.USA/World Chief Engineer.
80-83 Bucknal-Austin, Consultants. Chairman
Interests: Sailing Bridge Education Sport Walking

2007 GIBBS J W CEng MIET
40 Kipling Way, East Grinstead, West Sussex, RH19 1TE
John and Janet *01342 326501*
50-64 Student Appretice & Junior engineer – Telephone manufacturing Co. Ltd. 55-57 National Service RAF 64-68 AEI Ltd Advanced Telephone labs, Blackheath - telephone exchange design. 68-90 BT Various positions.
90-98 Adult Education - maths tutor

Interests: Sailing, Railways, Model Railway Building, Badminton, Gardening, Walking

2007 LAWTON C J MSc MRICS DMS MIArb
12 Shirley Close Rustington Littlehampton BN16 2EG
Chris and Rosemary 01903 859798 69-70
Site Surveyor Nepal East/West Highway project.
75-78 NEDO Technical Secy. Bldg and Civil Eng. Construction Indices.
79-81 MOD Overseas Const. Budget Mgr.
82-86 AWRE Aldermaston (Trident Works) Finance Mgr.
90-94 HMP Strangeways Finance Director.
96-00 Prison Service Head of Constr. Procurement and Finance.
96-02 Prison Service Chief Quantity Surveyor
Interests: Walking, Bowling, Bridge

2007/2008 Handbooks

By now everyone should have a copy of the 2007/8 Handbook either by picking up one at the Cooch Lecture or it was sent to you.

If you have not received a copy can you please let the secretary know and he will arrange for you to receive one. If, in error, you have received two copies, could you please return one to any member of the committee.

Subscriptions for 2007 / 2008

These were due on 1st October; if you have not already done so, can you please send your cheque for £12 to the Hon. Treasurer,

B Buckroyd, 6 Fosters Close, East Preston, Littlehampton, BN16 2TL.

Website for the RCEA

For latest information log into **www.rceasussex.org.uk**

Northbrook College, Worthing

Northbrook College is currently in need of extra Governing Body Members. Volunteers are required from people who have senior level organisational experience, such as that many members of the RCEA will have. As a Governor you would need to commit a small amount of time to attend meetings at the College, (perhaps 8 – 10 meetings a year), to contribute to the discussions for determining the strategic direction of the College and for monitoring its progress.

The remit for a College Governor is different to that of a School Governor because a College operates as a financially independent organisation and has no direct Local Government input to control its operation. College Governors operate in a similar way therefore to Company Directors.

If you would be interested in making a contribution to the education of young people you can obtain further detail from the Clerk to the Corporate Governing Body, Julian Millerchip, at Northbrook College, Littlehampton Road, Worthing, BN12 6NU, or by email jmillerchip@nbcol.ac.uk

Brief Detail Talks, Outings and other activities January – April 2008

Talk: Tuesday 8 January, 1430 Field Place, Worthing
Emergency Response Technology by Malcolm Phillips.

The talk will review how to identify Hazards on Process Plants, and what happens when protective measures fail. It will illustrate what happens when things go wrong that lead to fires and explosions, which have an impact on life, the environment, company assets and company reputation.

The speaker will then show what technology is available to mitigate the consequences of disasters through a well-prepared and equipped emergency response.

Visit: Tuesday 16 January, 1500 Gatwick Mail Centre.

Repeat of visit on 2 October 2007 [3rd of a series of 3]. Application list already full.

Talk: Tuesday 12 February, 1430 Field Place
Innovations and Disasters in Instrumentation – Part Two by Jim Buckland.

The speaker will continue, from his previously, well received talk, to tell of his personal experiences with various types of ingenious instruments that were mostly used in an assortment of U.K. military devices.

Spring Lunch.

Thursday 13th March, 12.00 for 12.30 pm Northbrook College, Worthing in the Arundel Room Training Restaurant.

The cost this year for a three-course lunch and coffee will be £ **10.00.** Our number will be limited to 40 because of their space consideration.

If more than 40 members and guests apply, we will prepare a "waiting list"; you will be informed if you are on this list. In all other cases you can assume you have been allocated the places you have applied for.

*Please return the reply slip at the end of this newsletter no later than **1st February***

Talk: Tuesday 11 March, 1430 Field Place

Prospects for Fusion Power; Chris Carpenter, Head of Public Affairs, Euratom UKAEA Fusion Association.

With fuel reserves dwindling and climate change, research into new energy resources is essential.

One alternative is Fusion – the process that powers the sun and it is close to becoming a reality. The European JET experiment in the U.K. has proved fusion works and the international experiment ITER being built in France will make electricity generation from fusion a reality.

Visit: Tuesday 18 March, 1400 Tour of HPC PLC. Burgess Hill.

This precision engineering firm is rated as a Full Service Provider, supplying complete assemblies to the specific requirements of Europe's premier automotive groups. Using comprehensive CAD/CAM and CNC-machining facilities it provides a best in practice service. For Safety reasons numbers attending are limited to twenty.

HPC Engineering PLC, Victoria Gardens, Burgess Hill.

*Please return the reply slip at the end of this newsletter no later than **1st March***

Visit: Tuesday 8th April at 1400. Visit to HMD Sealless Pumps Ltd., Eastbourne. This visit was originally scheduled for the 23rd October 2007 but had to be postponed due to Company commitments. Applications have already been received for this visit and members who are going will be informed later of assembly arrangements, etc. The list for the visit is currently full, but if you wish to be added to a waiting list please contact Richard Norton Tel 01903 242204

Outing: Wednesday 22 April, 11.00 Tour of the Chichester Festival Theatre.

Tours of the Theatre usually last around an hour and include visiting various areas of the Theatre such as the foyer, auditorium, lighting box, sound box, dressing rooms, green room and more.

Full details of arrangements for this outing are not yet available. They will be published in the next newsletter with a suitable reply slip. Please note the return date for the reply slip is likely to be only a few days after the newsletter is delivered.

REPORTS

Visit To Ricardo Design, Shoreham, September 4th.

A group of ten members enjoyed a tour and talk session at Ricardo Design on the evening of September 4th. The Shoreham site is where Mr. Harry Ricardo first started his work on engines. It is now the workplace for between 700 and 800 staff concerned with the development of engines, fuel systems, transmission systems plus both inlet and exhaust systems.

Our host Dave Morrison, Head of Marketing, had arranged for two colleagues to also act as guides, so we had the benefit of a very individual service.

The tour included seeing two of the vintage cars that the site keep taxed and insured for use on special occasions. One was a very rare Ricardo built car, the "Dolphin", and the other was claimed to be the first production car with a Ricardo diesel engine, the Comet Mk. 111, in a 1935 Citroen "Rosalie".

The displays of some of the many engines that Ricardo have been involved with included the original two cylinder two stroke, designed and built by Harry Ricardo for a car. This engine found its way into many of the local Shoreham fishing boats, being well suited to prolonged low speed and proved extremely reliable.

Another engine of interest was a JCB 444-LSR, two of which were used in the Dieselmax successful breaking of the world land speed record for diesel cars. At 350 mph. it had been limited by the tyre technology. This racing engine had been developed from the existing JCB 444 used for sturdy construction equipment.

We were also shown an "exploded" version of a Ricardo diesel-electric hybrid. Here the 6kw.electric motor was continuously coupled to a turbo assisted 1.4l. Diesel. The electric

motor was used as the 'starter', assisted at low revs, where the diesel torque was limited - up to 1500rpm, and then recharged the battery with regenerative braking. These hybrid engines had been fitted to both a Vauxhall Vectra and Alfa-Romeo respectively, and demonstrated successfully to car manufacturers in Japan.

Also displayed was the 6.6l. Duramax Turbo Diesel and 5 speed Allinson automatic transmission that Ricardo helped develop and install in the non-military version of the Hummer - the H1.

We were shown a Vauxhall Vectra set up in an echo proof chamber, with rollers set in the floor for the vehicle to run on, forced ventilation and exhaust. This set up enables Ricardo to 'tune' any car to the noise 'signature' that the manufacturer desired. A Porsche Boxter was in an adjacent bay, being prepared for testing.

Our tour included looking in the control room of one of the four engine test bays on the site. These test bays complied with all the requirements of the Occupational Health and Safety Regulations. The building of the test facility had been a thoroughly researched and debated project, as it cost over £10 million, but had fortunately, been busy ever since they had been commissioned

After light refreshments Dave Morrison gave us a slimmed down presentation of the "Challenges and Drivers in the Automotive Industry". This was based on his successful one-day lectures given to various Universities and other technical bodies.

These 'Challenges' were summarised as: -

(1) The need to reduce the effect of vehicles on the Environment, [i.e. CO2, NOX, and particulates],
(2) The need for the vehicle manufacturer to stay profitable, and also
(3) The need to continue to satisfy the needs of the Customer.

In the USA and Canada, small vehicles were predominately petrol driven, but are now turning to diesel power, whilst the Japanese with their very limited spaces, and memories of noisy, smoky diesel trucks were prejudiced against diesel cars. China and India are both seen as areas for significant development for Ricardo technology.

Light duty diesel technology was constantly improving, giving good fuel consumption and controlling NOX, but complex controls were needed to control the turbos.

The petrol engine still had potential, and was cheaper to produce { £25 - £50 per Kw. versus £10,000 -£30,000 per Kw. for a fuel cell}. Lean Boost and direct injection improved petrol consumption, and Ricardo were part of £2m Government project to produce an experimental 2stroke/4stroke petrol engine.

Hybrid engines offer several routes, but the most exotic are currently very expensive. - A Stop/Start function on an IC engine could save 7% on fuel, was relatively cheap, and could be fitted to a million new cars a year!

- A 'Mild' Hybrid engine could save 30-35% on fuel [such as the diesel/electric described above] cost £5k - £10k extra per car.
- A 'Full' Hybrid could save up to 40% on fuel, but currently is prohibitively costly.
- A fuel cell engine required significant work on both the car system and the fuel storage/distribution costs

In summary the way forward was seen, by the speaker, as being in the improvement of power transmission – the use of electric all wheel drive, in the downsizing of the combustion engine (high speed, turbo-assisted), and in the increasing use of Bio-fuels.

J Pound

Talk

History of the Electricity Supply Industry in the U.K.

Some highlights of the talk given by Ken Lane on Tuesday 18 September 2007.

Before Alessandra Volta invented the Voltaic Pile in 1800 the only source of electricity available to scientists had been static electricity produced from friction machines. Early in the 19th century a number of scientists established the connection between magnetism and electricity and that magnetism could be produced from electricity. Michael Faraday set out to show that electricity could be produced from magnetism and his original experiment is the principle used in all modem power stations today.

Of all the discoveries made in the 19th century the conversion of mechanical energy into electrical power was probably the greatest.

Following the development of the carbon filament lamp by Joseph Swan and Thomas Edison in 1879 the industry was ready to take off and the worlds first power station was opened at Godalming in Surrey in 1881.

The development of the 132kV National Grid in the early 1930's reduced costs and improved reliability.

Nationalisation of the industry in 1948 enabled a programme of rural electrification to proceed more quickly and standardisation of electricity supplies to be implemented. A dramatic increase in load growth during the 1950's and 60's brought about the need for the 400kV Supergrid.

In 1950 coal accounted for 90% of the primary fuel used in generation but this has now declined to about 33% with natural gas now accounting for nearly 40% and nuclear power about 20%.

In France 80% of electricity is generated from nuclear power and the cross channel link with a capacity of 2000MW provides about 4% of the U.K. 's electricity requirements. Following privatisation of the industry in 1990 most of the country's Regional Electricity Companies have now been taken over by foreign companies.

K Lane

Tuesday 2nd October 2007 at 1500. Visit to the Gatwick Mail Centre.

Wednesday 7th November 2007 at 1500. Visit to the Gatwick Mail Centre We have arranged for three visits by members to the Sorting Office at Gatwick. Two have already taken place; the third is on 16th January 2008. For each of the visits, Royal Mail have arranged for a senior engineer, now in a management position, to be our guide, which, certainly for the first visits, made them very interesting and informative.

After giving a general overview of the Gatwick operation, we went into the main hall, the size of several football pitches.

Here six main sorting lines are installed, each capable of handling 32,000 letters per hour but normally running at 28,000 per hour. For letters up to A5, the machines line up the letters, read the postcode, determine whether they are first or second class and finally sort them according to the destination Sorting Office. The speed at which they go through the process is quite amazing, but our guide could not tell us the mph ! Guessing, about 40mph.

Larger envelopes, packets and letters with un-identifiable postcodes are rejected. Large envelopes and packets are, effectively hand sorted. Those needing a postcode are shunted into a remote reading line and the image sent by wire to a Post Coding Centre, which is in Birmingham. Here they are individually read on a screen by an

operator, a postcode added or identified and the signal sent back to Gatwick where the coding is added and the letter re-joins the stream. Having been sorted, the letters are placed in trolleys, known as Yorks, and are wheeled to the dispatch bays ready for, mainly, overnight distribution.

Whilst the whole operation is largely automated, there is still quite a lot of manual handling. Thinking of the current talk about improving the "efficiency" of Royal Mail, it is not easy to envisage how much of this can be eliminated. However, those of us who visited the erstwhile Brighton Sorting Office about 12 years ago saw tremendous advances.

Perhaps the pity is that whilst we in the UK invented and pioneered automatic letter sorting, all the machinery at Gatwick is German.

Altogether, a most satisfying visit and hoping that the final group find it as interesting.

R Norton

Talk

The History of The Panama Canal

Some highlights of the talk given by Leslie Eteson on Tuesday 9 October 2007.

Following on from the success of the Suez Canal, which opened in 1869. Ferdinand De Lessops, in 1881, formed a company to build a canal through the Isthmus of Panama. Shares sold like hot cakes and in 1882 a 100 year lease was signed with Colombia and work started on the new canal.

However the conditions and terrain were very different to those where the Suez Canal was built. The area was subjected to torrential rain for much of the year and at the Caribbean Sea end there were deadly swamps and at the Pacific Ocean end there were high mountains. After 8 years there was no canal despite 287 million dollars having been spent and as the money had run out the company was bankrupt.

During this time approximately 25.000 workers had died mainly of malaria and yellow fever

In 1904 the Americans who were very keen on the prospect of the canal to enable the West Coast States to trade with Europe, bought up the lease, the partially completed railway and canal and all the equipment for 40 million dollars. The equipment included a number of 95 ton steam shovels.

One of the first things the Americans did was to set up a base employing many doctors and scientists to control the endemic diseases.

After trying to blast a canal through the mountains they decided to raise the canal level 90ft. above sea level and flood a valley through the mountains. This involved constructing locks at each end of the canal. Also rather than attempt to drain the huge swamp area as the French had done they built two dams on the rivers and flooded it to produce two large lakes, Lake Gatum, which is 164 sq. miles in area, and Madden Lake.

This also enabled them to develop a hydroelectric power station and so provide electric lighting for the whole length of the canal to enable round the clock working during the construction. Later Panama City was also supplied with electricity including street lighting, which at the time was ahead of London.

Two sets of three parallel locks; use gravity of water without any pumps. to raise or lower ships a total of 90 ft.

The canal, which had cost the Americans 352 million dollars to build, was completed in 1914 but the official opening was delayed until 1922 due to the 1914-18 war. The labour force, which had peaked at 50,000 workers in 1909-10, came from 97 different countries.

Under the terms of the extended lease the canal was handed over to Panama in 1999 but the Americans, who built a bridge across the canal near Panama City in1942 for access, still maintain a combined armed force near the canal to ensure its defense.

It takes approximately 8 hours for a ship to pass through the 50 mile long canal and costs a large cruise liner £60,000 in dues or roughly £40 per passenger.

K Lane

Friday 12th October at 10.00. Visit to Woking Council Energy Conservation Scheme.
Cancelled due to lack of support

Tuesday 13th November at 1430, The Barn, Field Place, Worthing
The Cooch Memorial Lecture:
From Whirlwinds to Lightnings – Living with Aircraft
by Wing Commander G L Perry C.Eng, MS, BSc(Eng), ACGI, MRAeS, RAF(Ret'd),

This was a very entertaining talk illustrated with a number of aircraft pictures Graham had taken during his career in the RAF and in Industry. While at school he had been inspired to become an engineer through his involvement with the Air Cadet Force. On leaving school he went to University to study aeronautical engineering and then joined the RAF at Cranwell for his Officer, Engineering and flying training.
It soon became apparent to him that 'team work' was the key to the successful and the safe operation of aeroplanes. His view was that most engineering decisions taken in the RAF were based on a consensus of opinions rather than by direct order as the best way forward and that this ethos was the one, which best described the way in which they worked.

He then went on to outline a number of amusing situations he became involved with while in charge of the repair and maintenance of a number of aircraft, starting with his first assignments on the Whirlwind Helicopter through to his later exploits with the Lightning fighter / bomber.

Communication between team members was paramount to ensure the aircraft were reliable in service and safe to fly. Unfortunately there were often 'official difficulties' to overcome in addition to those solely presented by the aircraft. This often meant that 'economic solutions' had to be found to quite serious engineering problems because the RAF budget would not stretch to the 'obvious solution'. Some of these problems and their amusing solutions were outlined.

In flight refuelling was another challenge for him and during a four-year secondment to the USAF where he was able to compare their technology and techniques with those employed by the RAF. His description of the in flight refuelling procedure in the USA and the UK with the need for extremely accurate flying was filled with light hearted commentary on the processes, the engineering problems and the demur of the pilots who undertake these operations.

Thursday 22nd November at 1400. Guided tour of McBean's Orchids, Cooksbridge, Lewes.

Forty-four members and guests were given a tour of the McBean's Orchid growing facility at Cooksbridge. This is the highest number of members and guests to take part in a visit or outing for several years.
McBean's a family owned company have been growing orchids for sale at their site for over 100 years and is worth a visit if you are ever in the area and did not attend this meeting. Our

party was split into two groups to be taken around the greenhouses by the two senior growers / specialists in orchid horticulture. The guides gave a detailed commentary in each of the greenhouses on the techniques they employ to cultivate and propagate the different types of orchid they have to deal with from different regions of the world. This included an explanation of the different temperature conditions needed in each of the growing areas, the watering techniques, the need for fertilisers, the general care and attention needed, pest control, etc., for the different species of orchid being grown.

There were many questions raised and ably answered by the experts for the serious gardeners in our party. While for the less able gardeners the message was clear, keeping orchids is not straightforward.

The tour finished with a visit to their orchid display area that showed many of the species they were cultivating in a simulated natural environment.

(Photographs E Pinto)

Christmas Lunch at the Beach Hotel, Worthing.

Monday 10th December, at 12.00 for 12.30.

Forty-five members and guests enjoyed a Christmas Lunch at the Beach Hotel. This is the second year running that we have held this function and as a result of the support it has received the lunch will now become an annual feature of the RCEA calendar.

Tuesday 11th December at 1430, Field Place, Worthing

Talk: Whittle v. Van Ohain, The race to develop the Jet Engine by Michael Hoolahan.

Our speaker, an expert on licensing and patents, gave us a most interesting talk on the lives and achievements of these two men with whom he had worked. The talk was divided into two sections. The first dealt with the life of Frank Whittle from the time he applied to join the RAF as an apprentice up to the time of his death, while the second compared the life and achievements of Van Ohain with those of Whittle

The first part of the talk explained how Whittle joined the RAF at Cranfield as an apprentice having been turned down earlier because he was unable to meet the entry requirements for height, how he learnt to fly, and how he eventually went on to Cambridge to read engineering. As early as 1929 Whittle had written a paper suggesting jet propulsion was the way forward for aircraft propulsion systems. The Air ministry rejected this idea, and so his battle to develop the jet engine started.

He applied for a patent in 1930, which was published in 1932, but he soon had to abandon it because he could not afford to pay the annual renewal fees. By 1937 he had secured a limited amount of cash to enable him to develop his ideas and in 1938 the RAF started to take interest and invested a small amount of extra funding to allow development to proceed further.

By 1939 the idea had become more acceptable and the Gloster Aircraft Company was commissioned to build a suitable plane for the engine. The plane first flew in 1941 and this stimulated further development by Rolls Royce and GE (USA).

In 1943 the first Meteor aircraft flew and this eventually went into service in the RAF in 1944, but had a very limited service life in the last year or so of the war.

Frank Whittle had a nervous breakdown in 1944, brought on by the intense pressure and workload he had endured through the previous years, and had take 6 months sick leave to recover. He was promoted to the rank of Air Commodore in the RAF at this stage of his career, retiring from service life in 1948. After retiring he worked as a consultant for a number of companies, and some in the US, developing turbine driven oil well drills.

The UK Government eventually rewarded him for his work in developing the jet engine; he was given a grand total of £100,000 tax-free.

Van Ohain, on the other hand started out as a physics graduate in Germany, and wrote his thesis on aircraft flight using jet propulsion in 1933, some four years after Whittle, but by all accounts, completely independently.

He went on to actually develop his own small-scale jet engine in his garage before being noticed and invited to join Heinkel who would provide him with workshops and financial assistance to develop his engine further.

With this assistance Van Hain soon had a working prototype. The German Government recognised the importance of the work that had been done and commissioned Messerschmitt to build an aircraft to test the newly developed propulsion system. By November 1939 the first German jet propelled aircraft was flying, more than a year in front of the first British plane.

The first twin jet engine German aeroplane flew in 1943, about the same time as the British Meteor, and had it not been for the direct orders of Hitler who wanted this aircraft to be developed as a bomber rather than as a fighter, this aircraft would have been in service by 1944. It was early 1945 before the aircraft could be used successfully against the Allied Forces. Had it been deployed earlier it would have been a serious threat to the advancing armies as they moved towards Germany.

Luckily for the Allies this aircraft was unreliable and extremely difficult to fly, only 300 or so entered operational service. Over 1400 crashed while pilots were in training. If all of these aircraft had become operational the final battles of the war would have been even more protracted.

Van Ohain moved to the south of Germany towards the end of the war and was recruited by the Americans, when they occupied the area, to join the US Airforce Research Centre. He and Frank Whittle met not long after the war and became good friends.

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REPLY SLIP 1:

To Brian Buckroyd, 6 Fosters Close, East Preston, Littlehampton BN16 2TL
Tel 01903 784926 or at brianbuckroyd@hotmail.com

I/We wish to attend the **Lunch at Northbrook College, Thursday the 13th March 2008.**

Full name:……(Block capitals)

Address………

……

……

Phone No…… **Number of Persons**……..

Name of guest/s…….

I enclose a cheque made payable to RCEA for **£……..…(£10.00 per person)**

Please return this reply slip by 1st February

(Separate cheque please)

RCEA members are covered by a Members' Club Protection Policy whilst engaged in Association activities. Please be advised that this cover does not extend to non – members and guests.

REPLY SLIP 2:

To:

John Pound, Tranquility, 47 Hawthorn Road, Broadwater, Worthing BN14 9LT, (telephone 01903 531153). (johnepound@AOL.com)

I wish to attend the **Tour of HPC PLC. Burgess Hill**. **Tuesday 18 March, at 14.00**

Numbers will limited, so it will be first come, first served, with a reserve list.

Full name……(Block capitals)

Address……

…….

…….

Phone number……

Applications please by 1st **March**

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