NEWSLETTER

RETIRED CHARTERED ENGINEERS ASSOCIATION
WORTHING

Hon. Secretary: S. Oliver Elphin, North Dive, Angmering, BN16 4JJ ☎ 01903 787116

FORTHCOMING EVENTS

29th Oct	Thursday	Coffee - with Partners at Beach Hotel, Worthing
4th Nov	Wednesday	Coffee - at Albion Inn, 110 Church Road, Hove
10th Nov	Tuesday	**Visit** - LEC Refrigeration, Bognor 2.30 p.m. see pages 4 & 5 for information and application form
19th Nov	Thursday	Coffee - at The Spotted Cow, Angmering
26th Nov	Thursday	Coffee - with Partners at Beach Hotel, Worthing
27th Nov	Friday	**Cooch Memorial Lecture** 2.30 p.m. Worthing Library "Power frequency fields and people" by Dr.D. Renew, National Grid
2nd Dec	Wednesday	Coffee - at Albion Inn, 110 Church Road, Hove
8th Dec	Tuesday	**Talk** - "A practical approach to software reliability" by Eur.Ing A. Gordon, guest 2.30 p.m. Field Place
14th Dec	Monday	Copy date for next Newsletter
17th Dec	Thursday	Coffee - at The Spotted Cow, Angmering
31st Dec	Thursday	Coffee - with Partners at Beach Hotel, Worthing
Every	Monday	Coffee at Laing's Arcade Cafe, Montague Street, Worthing

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

Errata

New member D. Matthews (details given in the August Newsletter) is a Member of the Institute of Chemical Engineers.

We welcome the following new members to the Association:

1998 **WINFIELD, N.D.** M.I.Mech.E., F.Inst.Mgt. *The Old Flint House, Church Lane, Ferring,Worthing, BN12 5HR (01903 246072)* Project Eng., 600 group of companies-Machine Tools-4 yrs. Works Eng., Kodak LTD, Film production-10yrs. Chief Eng. Cheesborough Ponds, cosmetics-4yrs. Chief Eng. Whitbread plc, Beer,Wine & Spirits production & distribution-2yrs. *Interests:* Astronomy, Economics, Local history, Probus, Sport.	1998 **LITHERLAND, D.** M.I.Mech.E. *14 Marshall Avenue, Worthing, BN14 0ES (01903 872426)* 1949-64 Asst. Sup. Eng. Alfred Holt & Co., (Blue Funnel Line). 1964-74 Mech. Eng. Worthing Corp'n. 1974-84 Asst. Div. Manager (Operations) Southern Water Authority. 1984-93 Engineer, Capital management, Milk Marketing Board. *Interests:* Golf,Photography, DIY
1998 **HARRISON, C.** A.Met., M.I.M. *41 Cluny St, Southover, Lewes, BN7 1LN (01273 487026)* 1956-59 Lieutenant - Instructor branch - Royal Navy. 1973-85 Manager materials quality - STC Ltd, Brighton. 1987-98 Project manager - British Standards Inst. *Interests:* Tennis, Music, Gardening	1998 **COCKBURN, Eur.Ing. J.** A.E., M.I.E.E. *19 Whyke Road, Chichester, PO19 2NN (01243 783387)* 1955-57 Marconi, Chelmsford. 1960-74 Radar development, Ferranti, Edinburgh. 1974-98 Electrical propulsion and battery specialist, GEC-Marconi, W/Ville. Commissioned in RAuxAF 1964-91 *Interests:* Model engineering, Industrial archaeology - member of Newcomen society, Hill walking

47th Annual General Meeting - 8th September 1998

The minute for item 7 of the agenda is reproduced for information as it was too late and costly to incorporate the modification made at the AGM into the handbook. This will be corrected in the next handbook.

7. Rule Change proposed by the Committee.

This was discussed at some length and a proposal by E. Markwell, seconded by A.G. Standbridge, that the first paragraph of Rule 4 should be :-

"There shall be an entrance fee. Subscriptions for each year become due on October 1st. The subscription and entrance fee for each year shall be evaluated at the Committee Meeting of the Association held in the previous May and be approved by the Annual General Meeting".

was approved unanimously.

The proposal that the entrance fee be £10.00 and annual subscription be £12.00 was then approved by 31 votes for with 3 against.

13. Any other business.

(a) S.R. Renew proposed that the Cooch Memorial Lecture Student Prize be

increased in value to £100.00. Seconded by R.G. Bailey. This was carried by 21 votes to 2 with 11 abstentions.

Annual Subscriptions

These are now due. Please send your cheques for £12 to the Hon. Treasurer, D.R. Collard, 9 Meadway, Rustington, Littlehampton, BN16 2DD. If you are not sure whether you have already paid, and to save sending out reminders, please contact the Hon. Treasurer on 01903 785580.

Its all about time - Talk by R.W.V. Norton, member, at Field Place, 2.30 p.m., on 6th January, 1998.

After outlining an interest in clocks since very early childhood, a summary of the history of time-keeping over the last 5,500 years was presented in three-quarters of an hour!

From earliest recorded references to time, the constancy of the earth's rotation in relation to the sun and stars has been recognised. It was the development of astronomy as a science that led to man's interest in time-keeping as we know it to-day, to the point where the lives of people the world over are governed by time. Nevertheless, this situation, for the vast bulk of the world's population, did not apply until the industrial revolution when the organisation of work in factories and travel - especially railways - changed things.

But from historical records, our ancient ancestors were concerned with time. Homer in the 8th century BC refers to "Suns, Nights, Sleeps and Dawns". Shakespeare refers to hours - but not minutes or seconds. Fortnight is a very old Teutonic term referring to the fourteen nights of darkness between the last quarter and first quarter of the lunar cycle.

The time between similar lunar phases of 29 1/2 days (29.5305882) and the time between similar solar events 365 1/4 days (365.242199) were known to both the Chaldeans and Egyptians about 4,000 years ago and both were capable of measuring them to within a minute or two by means of stock gnomen and water clocks. The calendar month was probably derived by dividing the solar period by the lunar period, giving 12 + 10.875 days. As early as 2100 BC, this system was in use, the extra 10.875 days - intercalation days - were allocated by Royal decree on the advice of astronomers.

The main step to the modern calendar was the adoption of the Julian calendar in the Roman Empire by Julius Caesar on 1st January 45 BC. He wanted to eliminate some three months disparity between the astronomical and civil calendars due to the use of easy fractions for the intercalary days. Caesar devised the Leap Year system and probably the system where the remaining eleven months are divided into 4 of 30 days and 7 of 31 days.

After some 600 years of continuous use of the Julian calendar, miscalculation of the intercalary days had built up 10 days of distortion and Pope Gregory 13th instituted the new style Gregorian calendar, which we use to-day. Designed by a mathematician, Luigi Ghaldi, it is designed to last at least until the year 16,000. In the Gregorian calendar, every year divisible by 4 is a leap year excepting the first year of every century unless it itself is divisible by 400 - so 2000 is a leap year, 1900 was not.

The Gregorian calendar was adopted in all Catholic states by December 1582; by the Protestant states of Germany in 1700 and in Britain in 1752, when the intercalary days had grown to 12 - 2nd September 1752 became the 14th. The Russians, however, retained the Julian calendar until after the Communist revolution in 1917.

The origin of the seven day week has been lost in the mists of time, but it probably derives from astronomers adopting four phases of the moon. The 24 hour day probably derives from the ease with which a circle can be divided into six parts by stepping the radius round the circumference, the circle in question being the line cast by the tip of a stick gnomon, literally a stick stuck into the desert sand. It is interesting to note that the 24 hour day was in use at the time when the decimal system was used in mathematics, 60 minutes in the hour and 60 seconds in the minute are both thought to have been devised by Hindu astronomers who divided the day into 60 parts. The thought was offered that perhaps things happened the other way round and that the second was derived from the human heartbeat!

The Christian church had some impact on time-keeping in that from the 6th century AD prayer times have been standardised, so we have Matins at 3 a.m., Prime at 6 a.m., Terce at 9 a.m., Sext at noon, None at 3 p.m., Vespers at 6 p.m., and Compline on going to bed, even if it is after midnight. There is no doubt that modern day clocks derived from the automation of bell-ringing to announce prayer times to the monks in monasteries.

The earliest clocks as we know them to-day - as opposed to bell-ringing devices - were made in the last quarter of the 13th century and, by the end of the 14th century, most churches had a tower clock, of Italian, Dutch or English manufacture; so, by 1400, modern methods of time-keeping had been established - a gestation period of 5,000 years. Over the next 600 years, to the present day, the accuracy of time-keeping has improved to the point where modern atomic clocks are more accurate than the passage of the sun and stars and leap seconds have to be introduced to take account of very small variations in the timing of the earth's orbit.

Time standards were all local until the advent of Thomas Bradshaw's Railway Timetables in 1839. Times being local, there was, for instance, a difference of 9 1/2 minutes in the clocks of Hull and Liverpool, the latter being 2 degrees 40 west of Hull at 4 mins. per degree. These differences led to the establishment of Greenwich Mean Time in 1880.

World travel and the electric telegraph lead to adoption of a world time standard based on the Greenwich Meridian, the setting of the International Date Line and the 24 time zones around the world. This was all agreed at a conference in Washington DC in 1884. The standard had been fully adopted internationally by 1900 and domestically too, with the notable exception of France, which waited until 1915.

The maintenance of GMT time standards was initially entrusted to Greenwich Observatory but, since the 1930's, the NPL has gradually taken over. Internationally, the time standard is co-ordinated by the International Bureau of Weights and Measures in Paris and is now based on a statistical average of some 270 atomic clocks around the world.

The atomic clock, the current world standard, was invented at the NPL in 1955 and its accuracy is derived from the stability of the vibrations of the Caesium 133 atom when electrically excited. The current definition of the second is 9,192,631,770 vibrations of the Caesium 133 atom. The accuracy of the present range of atomic clocks is 1 second in 317,098 years. NPL: are developing the next generation of atomic clocks and have a prototype working with 10 times this standard of accuracy.

The second part of the talk used the sub-title "What is a Clock?" and showed slides which illustrated the working principles of mechanical clocks, from Chinese water clocks of the 10th century AD, to the present day and tracing the development of the clocks in which these principles were applied. Perhaps the most intriguing to the members present was the "Atmos" clock, which has a small spring pre-wound at manufacture which is kept wound by temperature and/or pressure variation of its environment - nearly perpetual motion! The talk ended with a slide of a cuckoo clock accompanied by playing of the 1940's pop song "Tico Tico", sung by the Andrews Sisters, extolling the virtues of this type of clock - with an invitation to "dance in the aisles" which was not taken up by the members!

Richard Norton

Visit to LEC Refrigeration, **Bognor Regis** on Tuesday, 10th November, 1998 at 2.30 p.m.

Whilst LEC have long been famous for a popularly priced range of domestic refrigeration appliances, they have recently embarked on a new venture intended to compete head-on with the likes of Bosch at the luxury end of the market.

Our visit is to the completely new factory, purpose-built to manufacture this new range of units. The factory is in production but is still in a "shake-down" period. Some impressive plant has been installed, including automated testing, although much of the assembly is by hand in team cells.

The party is limited to 30 members. Parking is available near the new factory gatehouse where we are to meet, but car sharing is requested, to limit the number of cars. Please note, the new factory entrance is quite a distance from the "old" LEC factory in Shrimpney Road - please see map.

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To: R.W.V. Norton, 106 Wallace Avenue, Worthing, BN11 5QA Tel: 01903 242204

I wish to participate in the visit to **LEC Refrigeration** on Tuesday, 10th November 1998 at 2.30 p.m.

Full Name .....(Block capitals)

Address .....

.....

Phone No..... **Applications by 3rd November, 1998**

Car sharing I can offer.....seats from.....

I would like a lift from.....

Cooch Memorial Lecture **"Power frequency fields and people"** by Dr.D. Renew, National Grid, at the Worthing Library Lecture Theatre, on Friday, 28th November, 1998 at 2.30 p.m.

Electric and magnetic fields are produced at all stages of electricity production and use. An association between known levels of magnetic field exposure and leukemia has been suggested by some studies. However, even after nearly 20 years of research, a causal link has not been established.

After the lecture the R.C.E.A.prize will be presented to Mr Jason Black, who is studying for an M.Eng. at the University of Brighton.

The talk on 8th December **"Digital Television"** has been replaced, due to the speaker, Malcom Leak, being indisposed. We wish him a speedy recovery.

"A practical approach to software reliability" talk by Eur.Ing A. Gordon , guest, at Field Place on 8th December, 1998, at 2.30 p.m.

Many projects contain software and those that do not rely on it for modelling and design calculations. Customers ask about system reliability and most engineers are familiar with hardware reliability predictions. How do you give a customer software reliability figures?

Recordings of Meetings

An audio tape cassette is made of all talks and addresses at each of our General Meetings, thanks to the good services of Eric Roubaud. These tapes are available from the Hon. Sec., but they only go back about two years as the cassettes are reused.

List of members

Spring Break to France 17th to 21st May, 1999

The 1999 5 day, 4 night Spring Break will be based at the Hotel Mercure Rouen Champs de Mar. All bedrooms have private bathrooms, colour TV, telephone and hairdrier.

Throughout the tour use will be made of a 49 seater continental touring coach with air suspension, reclining seats, toilet and washroom. At the beginning of the tour members will be picked up from their homes by taxi and taken to meet the coach. At the end of the tour members will leave the coach and be returned to their homes by taxi. The Woods driver will act as courier for the duration of the tour.

The cost of the tour (excluding insurance) is £288.00 per person sharing a twin room. This cost is based on 30 fare paying passengers. There will be single room supplement of £80. If the number of passengers does not reach 30 persons, then a surcharge will apply. The tour cost includes door-to-door service; 4 nights half board Dinner and Buffet Breakfast; guided tour of Rouen; entrance to Monet's garden, Jardins d'Angelique and Le Clos de Coudray.

Travel Insurance is mandatory for Woods will not accept a holiday booking unless a person is adequately insured. Woods' Insurance is £11.50 per person; which is in addition to the basic £288.00 cost of the break. Should you already have adequate travel insurance, then you will need to advise Woods when you book for the tour the name of your Insurance Company.

The attached booking form should be completed and sent direct to Woods with a deposit of £70.00 per person, plus £11.50 per person, if you wish to be covered by the Woods Travel insurance. The tour is subject to the terms and conditions as featured in the Woods 1998 tour brochure.

Itinerary

Day One

An early departure to catch the 8.45 a.m. ferry from Newhaven to Dieppe and then to Rouen, arriving at our hotel, close to the River Seine, in time for dinner.

Day Two

A morning in Rouen with a guided walking tour, visiting the Cathedral and the old part of the town. After lunch, travel to the Jardins d'Angelique, offering a lovely display in the grounds of a Norman Manor house.

Day Three

A journey to Giverny, to visit Monet's house and gardens. There will be time for lunch at Giverny before a leisurely return along the Seine, stopping at Les Andelys.

Day Four

Travel north to the Clos du Coudray, offering a fine collection of over 6,000 plant species, as well as riverside gardens, rockeries and exotic plants. A convenient stop for lunch will be made before proceeding to the afternoon visit.

Day Five

A visit to Honfleur in time to have an early lunch and investigate Honfleur before returning via the Pont de Normandie to Dieppe to catch the the 3.45 p.m. (local time) ferry to Newhaven.

N.B. The afternoon Itinerary for day 4 is still under discussion.

booking form