

Bulletin

A Monthly Newsletter for RAL Staff

June 1994

RAL Commercial Office: 'Realising our potential'

The White Paper entitled 'Realising our potential' places great emphasis on technology transfer and there is now an obligation on universities and research laboratories to make this happen. Since 1988 RAL Research Services (RRS) has been responsible for overseeing this activity at RAL. During this period the repayment contract income has grown from £3.4m in 1988/89 to £20.1m in 1993/94 and currently involves 150 people. In addition there were receipts to SERC programmes amounting to over £4m in 1993/94. Repayment receipts amounted to nearly 30% of RAL's turnover for 1993/94.

RRS activities are those which receive no funding from the Research Councils and range from industrial work through to pure research contracts funded by the DTI and the CEC. Dr Gordon Walker, Head of RAL, is in overall charge of RRS and ultimately responsible for RRS projects. He is supported by finance and contracts staff and a Commercial Office under the direction of Bruce Patchett. The Commercial Office provides a single point of contact for industry and provides assistance in such areas as patent protection, contract negotiation, marketing and publicity. Responsibility for the technical work and project management resides with the individual departments who have an active RRS programme. Some research groups, such as the Radio Communications Research Unit, receive a significant fraction of their funds from RRS work.

Last month, RRS welcomed Adrian Wheldon as Head of External Business Development for DRAL. Adrian has just completed secondments with the DTI and the Office of Science and Technology where he headed the government's LINK initiative. Prior to that he had an active role in the direction of the JFIT and Alvey programmes in Information Technology. Some of you will remember Adrian from his involvement in NIMROD, ERSU and ISIS during his previous time here at RAL. As the Head of External Business Development he will now be dealing with the marketing and development of non-research council business. Operating from the RRS Commercial Office, Adrian will be responsible for the management of DRAL repayment activities along with the promotion of further repayment activities and the development and implementation of a strategy for these across DRAL. The marketing of external business, through the promotion of technology transfer in support of wealth creation will also be part of Adrian's responsibility.

RAL Research Services and Daresbury Research Services (DRS) will continue to be managed by Bruce Patchett and Neil Marks respectively.

Adrian Wheldon can be contacted on ext 6826. Bruce Patchett can be contacted on ext 6368. ■



Bruce Patchett, Gordon Walker and Adrian Wheldon (94RC3369)

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Arts & Crafts Exhibition 1994

The 11th RAL Arts and Crafts Exhibition was held last month and once more proved to be a great success. 48 exhibitors showing 280 wide-ranging items pleased all tastes, from novice art lovers to seasoned art critics!

A steady stream of staff, family and other visitors flowed through the conference rooms in R68 to the music of Vivaldi's Harp and Lute Concerto. Jenny Coates, the official organiser of the three-day event, had transformed these rooms into tranquil settings where many old friendships were renewed.

The idea of the Exhibition was first thought of by Myra Gilbert and Jenny in 1978. They thought it unfortunate that the artistic skills and talents of their friends and acquaintances on site should go largely unseen by other staff at RAL.

With this in mind, the two launched the inaugural event in 1979 with an emphasis on what still remains today; thoughtful displays of exhibits, high quality entries and visitors' enjoyment. It was decided after the first show to have a collection for local charity. The Sue Ryder Home, the Cheshire Home, the Home Farm Trust and many others have all received donations.



In 1989 the Rec Soc presented the first Myra Gilbert Perpetual Trophy to Nick Whitefield. This year's worthy winner was Brian Holland.

The Exhibition is held once every two years, ensuring that there is plenty of time for quality exhibits to be gathered. Both Jenny and Myra hope others will carry on the Exhibition when they are no longer able. They wish to thank everyone who contributed towards making this year's Exhibition such a happy and memorable one. ■



Top right: Tanya Alam and Sharron Waring admire some of the work at the Exhibition (94RC3418)

Above: An artist at work. Visitors view the watercolours of David Farrell (94RC3417)

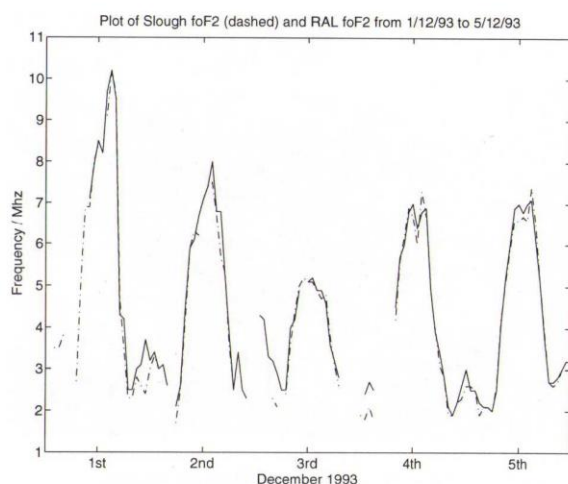
Right: The immaculate models of engines from the golden era of steam are met with looks of approval (94RC3416)



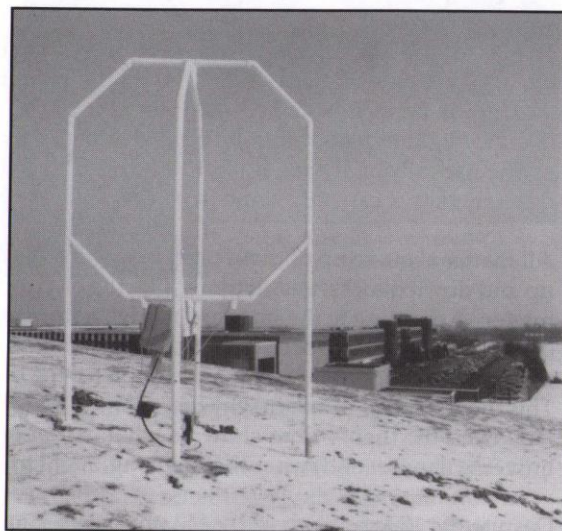
RAL continues historic sequence

The longest sequence of ionospheric soundings is to be conducted here at RAL. Regular soundings from Ditton Park, Slough commenced on 11 January 1931 and an early version of the 'ionosonde' has been in operation since December 1933. Since then regular observations of the ionised upper atmosphere (the ionosphere) have continued to provide the longest sequence of data of its kind anywhere in the world.

For a number of years now the Slough ionosonde has been maintained by RAL near its original site. However, with the closure of the Admiralty Compass Observatory, a new home was needed. A new low-power sounder was installed at RAL and has been running since December last year, in parallel with the old Slough sounder. Comparisons show very similar results from the two sites which means that the long sequence of observations can effectively be carried on from RAL. This period of overlap is planned to last until October this year and will be vital for calibrating the new data, such that studies of long-term trends will still be possible. There has been much recent interest in such trends because theoretical predictions of the effects of global warming indicate changes in the upper atmosphere which may be detectable in the long data sequence. In this respect, the second longest sequence is also important. This is obtained from Slough's sister site in the Southern Hemisphere at Port Stanley, which is also run by RAL and has operated since 1945.



Measurements of the peak plasma frequency in the ionosphere showing consistent results from the Slough and RAL ionosondes. Values peak near noon, but show great day-to-day variation



One of the four receiver antennae on the ISIS mound (94RC2264)

The new sounder at RAL is considerably more advanced than the old one, giving automated scaling of the results and exciting new research possibilities. The array of four receiver antennae allow the location and velocity of each part of the ionosphere which returns an echo to be monitored, giving new information on ionospheric motions and structure on a range of spatial scales. The data are not only of scientific interest, but are also used in the design and operation of communication, navigation and radar systems. These systems either exploit the ionosphere, or are disrupted by it. As well as showing changes within the solar cycle, season and time of day, there is great day-to-day variation (see diagram) and there may be ionospheric storms lasting several days. With the new sounder RAL will be better placed to provide both scientists and propagation engineers with the data they require. ■

Mike Lockwood

The great quark hunt

Top quark found by Physicists in Illinois ... or has it?

The last of the 12 subatomic particles which is generally believed by scientists to be responsible for the make up of the universe was 'sighted' last month in the Fermilab atom collider near Chicago. Its brief life makes it difficult to locate in so far as it has a life-span stretching all of one billion-billion-billionth of a second faster than the time it takes for light to pass through the nucleus of an atom. The only fathomable way of deducing its existence is by mathematically analysing millions of collisions in the accelerator. Through this it is possible to see any concurrent differences that can only come from the elusive top quark.

All matter is made up of these particles which come in two forms: 'quarks' such as the seeds of the atomic nuclei like up and down quarks, and 'leptons' like the electron and electron-neutrino. These two sets of 'twins' go to make up all matter. According to the standard model, nature repeated this three times making a total of six quarks and six leptons, of which only 11 have been detected in accelerators similar to CERN's Large Electron Positron in Geneva and in cosmic radiation in space. The top quark completes the final chapter which began with the discovery of the electron in 1887. This theory doesn't explain why there should be 12 building blocks nor does it explain the unusual distribution of mass. However, the theory does show us what matter on earth is made from. Extreme conditions, such as the state of the universe nanoseconds after the Big Bang, highlights the importance of its role.

Despite the 150 page report by 440 physicists some doubt still remains about the discovery. For those who are keen on the occasional bet, statistical analysis shows the odds to be 400-1 in favour of the find rather than Carlo Rubbia's revelation, which was just coincidence. Odds like these surely underline the feeling that the top quark has indeed been found.

Thirty years ago the Californian physicist Murray Gell-Mann named the quarks after the line in Joyce's *Finnegans Wake* "Three quarks for Muster Mark". Perhaps the world of Particle Physics can now turn to A A Milne for inspiration in his words "Now we are six". ■

BOOKHAM technology ltd in CMF

Bookham Technology is a small and energetic young company renting offices in R18 and paying to use the clean rooms of RAL's Central Microstructure Facility (CMF). Bookham staff, led by Managing Director Andrew Rickman, have, for five years, been designing and manufacturing silicon integrated optical circuits. The success of telecommunications, automotive, environmental and medical applications have been responsible for Bookham's rapid expansion. The company recently received its third grant under the DTI SMART scheme, a notable achievement in view of the intense competition for this prestigious award.

Bookham's co-operation with CMF began in 1992 when Andrew signed his first contract with the Laboratory, though he had worked here for several years before as a CASE student at Surrey University. A new contract has recently been signed and Bookham and CMF staff will continue working together for a further three years. Andrew looks forward to spending a further enjoyable and productive period working at CMF. He thanks staff at RAL for their friendly co-operation and wishes them every success for the future. ■



Andrzej Jezierski, Averil Compton, Andrew Rickman, Arnold Harpin and Mette Tholstrup of Bookham Technology (94RC2834)

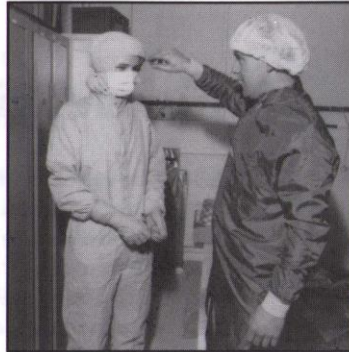
SCIPS on a Mars Rover

On Tuesday 17 May, a group of 15 year old pupils from schools in Newbury and the surrounding area visited RAL for the third Science Problem Solving Day (SCIPS).

Space Science Department supplied both the project and manpower. The objective for the day was to design a vehicle capable of collecting samples whilst travelling over the surface of Mars, otherwise called the 'Mars Rover'.

The students were split into four groups and given a specification and some general guidelines to work from. During a brief presentation by the students some ingenious ideas came to light, however impractical some may have been!

Having survived the morning session, they were given the opportunity to handle a real life solution designed by RAL space science engineers. A brief tour of Space Science followed where they donned special suits to enter the clean room, learnt a little about vibration testing, visited the Space Data Centre to learn about satellites and managed to spot their



Preparation is complete for the visit to the clean room (94RC3341)



Intensive study is required if the surface of Mars is to be negotiated (94RC3347)

schools and houses during a remote sensing session.

I'd like to thank the following Space Science Staff who gave up their time in their busy schedules, both in preparation for the event and support on the day: Jeremy Balchin, Mark Bannister, Peter McPherson, Neil Merryweather-Clarke, Nick Moulton, Chris Nelson, Chris Stephens, Ray Turner, Mark Willis and John Yates. Thanks also to Stephen Kill from the Photographic Section. ■

Anne-Marie Hamilton

Robin Walters

It is with great sadness that we record the death of Robin Walters on 23 April 1994 after fighting illness for six months.

On leaving school Robin served an apprenticeship with the Southern Electricity Board and spent the next 15 years working as an electrician, including a spell in Australia in 1967/68.

In 1975 Robin started a second career by joining RAL as a security warden. He moved to Transport Section as a driver in 1978 and very quickly achieved promotion to Assistant Transport Manager the following year. He was appointed Transport Manager in 1986. Everyone who used Transport's services will

remember him for his friendly and helpful manner, his organisational skills when journey planning and his reliability.

Robin was a long-standing, highly respected member of the RAL Golfing Society. He had the lowest handicap (6) in the Society and invariably played to it. In the annual RAL singles competition it was usual for members to ask who Robin was playing in the final. His skill with the golf club was never more evident than during the annual SERC Inter-Establishment Golf Tournament where for six consecutive years he won the best individual gross score prize.

On one occasion, a member of the

Society thought that it was time to change his clubs to improve his game. Robin took the clubs and hit some practice balls, demonstrating that it was not the clubs that were at fault! His skill and love for the game will be missed by those who had the privilege to play a round of golf with him.

A collection in his memory from his friends at RAL has raised funds for the Oxford Pain Relief Unit. Robin will be sadly missed by his colleagues. We extend our sincere sympathies to his wife Jill and family. ■

SPORTS Roundup

Masters of the green baize

There is a society that holds its meetings in a dimly lit backroom of the Rec Soc building. The RAL Snooker Section seems to be a well kept secret, but occasionally its members reveal themselves to the sunlight. Most can be identified by the sallow complexions and other signs of a misspent youth in the snooker hall!

There may be no Stephen Hendrys or Jimmy Whites but there are a few members who play with club teams in the Didcot and District evening league. Unfortunately there is no such team representing RAL. However, the Section holds its own internal singles competition for the Paul Williams Tankard and there are usually several entries at the Swindon Indoor Sports Day Pairs Competition. The latter has turned out to be quite a success story for the men in black waistcoats, for RAL has won it in 1988, '89, '90 and '92. Daresbury won in '91' and '93. This year, Richard Stephenson and David Farrell carried the honours for RAL yet again.

Club membership is currently full but visitors are welcome provided they are accompanied by a Section member.

For further information, please contact either Darryl Taylor (Membership Secretary & Treasurer) on ext 6663 or David Farrell (Section Secretary) on ext 5111. ■

Thunderbirds are go!

RAL staff have reason to be proud of Geoff Brown, Janice Brown (Captain), Katie Hopgood and Colin Uden. They are the winners of the RAL 1993/94 Crib League. It turned out to be something of a fight to the death as they battled it out with the 'No name team'. Despite being tied on points the 'Thunderbirds' came out on top by the number of matches won.

If anybody is interested in joining the Crib League please contact John Skrzyniarz on ext 6159 or Robin Wastle on ext 5278. ■



Top row left to right, Colin Uden and Geoff Brown, front row left to right, Janice Brown and Katie Hopgood, victors of the Crib League (94RC2981)

Gone fishing

The 17 members of the RAL Angling Club, several of whom are retired, have held the last of their monthly competitions of the fishing season.

The 'Ernie Russel Cup' and the 'Peter Craske Trophy' are undoubtedly the highlight of the Club's calendar. Both were won by Ray Rolfe achieving the most prestigious 'double' of the year.

Honours were not just bestowed upon Ray; Sonia Buckel weighed in with the heaviest catch of the day for RAL at the SERC Sports Day, Pete 'Bruno' Lay featured in Angling Times with his impressive catch of a Large Perch, whilst newcomer Gavin Fuller caught a 4lb Barbel, despite a shaky start to the morning.

Anyone who may be interested in joining the Club please contact Darryl Taylor on ext 6663. ■



Bruno with his famous fish as seen in the Angling Times

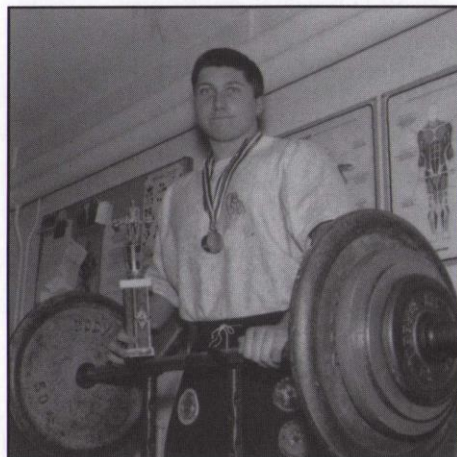
Up-lifting power

Life goes on at RAL unaware of the power that lies dormant within the Administration Building. Champion? Definitely. Record-breaker? Certainly. Lifting 582lb at the age of 19? Absolutely. The ability to stop a speeding bullet? Maybe not. Who is this man? Why it's no other than mild-mannered Martin Green!

In 1988 Martin was heralded as the Junior South of England Powerlifting Champion. Since then he has gone, if you'll forgive the pun, from strength to strength. He

now holds both the South of England and British Powerlifting titles.

Fitting in his four day a week training schedule around weight-lifting instruction, refereeing and his work at RAL is essential if he is going to carry on his success in the European Championships in April next year. Martin hopes that his attempt to break the British Bench Press record at the South of England Championships next month will set him on the road to Europe. ■



Martin displays his trophies and medals from the domestic circuit. He hopes next April will see him adding European gold to this impressive collection (93RC3484)

RALFC ensure survival in Division 2 after tough season

This season, due to a shortage of able-bodied men capable of getting out of bed on a Sunday morning, RALFC were reduced to one team competing in the second division of the Upper Thames Valley League.

The team endured mixed fortunes during the season with some excellent performances, some hard fought, well deserved results, some dismal losses and a couple of drubbings from far superior sides. The team finished fifth in the division (played 18, won 8, drew 2 and lost 8) which was a creditable achievement allowing for the standard of play and strength of the opposition within the League.

We also entered two teams in the Wantage 6-a-side Competition where the 'A' team reached the quarter finals of the 6-a-side Cup and the 'B' team reached the quarter finals of the Subsidiary Plate. Though disappointed not to have progressed further in the competitions, both teams acquitted themselves well and the weather was great so an enjoyable day was had by all.



RALFC, who finished fifth in Division 2 of the Upper Thames Valley League

This season's award winners (for excellence on and off the pitch?) are : Dean Plunkett, Player Of The Year; Simon Reeve, Players' Player Of The Year; Wayne Kelly, Top Goalscorer (17); and Ronnie Brumfitt, Clubman Of The Year.

On behalf of the players I would like to thank all those who have helped to organise the team and supported the club during a tough but enjoyable season.

Anybody interested in playing or helping out next season please contact me on ext 6673. ■

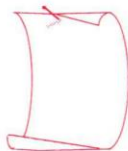
Ronnie Brumfitt

Site signs



If you are organising an event at RAL and need some directional signs, please contact Peter Bradley on ext 6517 in EBW. They can produce text in large blocked font combined with some choice graphics. Please contact Peter well in advance of your event with a cost centre number.

Noticeboard



Operation Phoenix

Simon Spurdle of the ISIS design office aims to travel to Bosnia on 27 June. His mission is to deliver aid to help relieve the suffering of the refugees in the war ravaged area of western Bosnia.

Simon will transport the essential supplies as part of a four truck convoy under the banner of 'Operation Phoenix', a local based charity concern. Transporting supplies to Bosnia is a costly exercise and Simon would like to hear from anyone who is able to contribute medical supplies or towards the cost of the venture.

If you wish to make a donation or would like more information please contact Simon on ext 6339, Rm 2.03, R2 ■



A 3-mile queue of trucks waits patiently at a checkpoint on the Rousse Bridge over the Danube

Acknowledgements

Gerry Brewer - Gerry would like to say "cheerio to all my friends and colleagues, and if we meet again in a pub in the future please do not hesitate to buy me a drink."

Robin Walters - Jill Walters would like to thank all those who contributed to the good cause of the Oxford Pain Relief Unit in memory of her husband Robin.

Pam Tappern - Geoff, Susie, Andrew, Jackie and Mike wish to thank all those who sent flowers and messages of sympathy following the tragic death of Pam.

RAL lectures

28 July 2:00pm Pickavance Lecture Theatre
The Origins of Metallurgy in the British Isles
Dr P Craddock (British Museum).

Postdoctoral Research Fellowships

The Austrian Science Foundation has received a special endowment to fund Lise Meitner Postdoctoral Research Fellowships for foreign researchers from all areas of science. These fellowships are designed to promote co-operation between Austrian scholars and fellows from other countries. They provide junior scholars with the opportunity of working in Austrian research institutes, located in universities and colleges or autonomous non-profit scientific organisations.

For further information please contact: Mr Robert Gass or Ms Susanne Menshick, Austrian Science Foundation (FWF), A-1040 Wien, Weyringergasse 35, Austria
Tel: +43-1-505 67 40-24 or 96
Fax: +43-1-505 67 39

Christian Fellowship

June 23 Discussion: 'Why do we read the Bible?'

June 30 'Sharing bread together'
All meetings will take place in CR6, R2 starting at 12:30pm.

RAL Bulletin

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