bulletin

TO PASTURES NEW

Departure - Friday 7 March; destination - South Africa; transport - Union Castle Line, S.S. Oranje; approximate distance - 6,000 miles; arrival - 24 March; name on passport - J G Newbold.

Last April the Laboratory said farewell to Ernie Newbold and we commented on the break-up of a family participation as both his wife and son John worked at the Lab. Now we are left with only one member of the family as John, after nearly seven years on the Chilton site is on the high seas and well on his way to a new life in South Africa. His final destination is Newcastle where he is taking up an appointment as a technician with the famous Stuttgart firm of Slemens, to work on a major installation project with the

South African railway. John served his apprenticeship with a Wallingford firm of electrical contractors and following two further moves joined the Laboratory's Electrical Services Section in RI8 in June 1968. For the first $4\frac{1}{2}$ years he was employed as a craftsman on the manufacturing side moving to R25 about 27 months ago where

he has been concerned with research and development on complex coil winding associated with superconducting magnets to which he has made valuable contributions.

To those who know John it will not come as a surprise to hear that he has two objectives in South Africa. The post with Siemens will provide experience in various branches of electrical work (power engineering, switch gear etc) plus educational facilities including the opportunity to learn Afrikaans. The other commitment is with 'Lifeliners', a religous organisation connected with the Assemblies of God whose aim is to further the work of the Gospel of Jesus Christ overseas and John will be involved in communal work in this organisation.



Photo - all smiles

On Wednesday 5 March, Jim Lawler, on behalf of John's friends and colleagues (many were present including Peter Clee and Roy Tolcher) presented him with an electrical multi-tester and thanked him for 6 years, 8 months and 23 days of service to the Lab, always with a smile and always to the best of his ability.

The final word is with John "My very best wishes to all my former colleagues and many thanks for the privilege of being able to work with you".

CAR ACCIDENT -LATEST BULLETIN We are very pleased to be able to report that both Chris Damerell and Harry Paterson who were involved in

a car accident last Monday are making good recoveries.

Harry, although badly bruised was not detained in
hospital. Chris, who was rather badly shaken, came out of hospital on Wednesday evening and sounded very cheerful on the telephone yesterday (Thursday).

RUTHERFORD LABORATORY LECTURE

A very recently arranged lecture will be given in this

lecture will be given in this series on Thursday 20 March at 15.15 in the Lecture Theatre. The title is "Medical Aspects of Space Flight" and a film is promised. The talk is to be given by Professor Edward H Kass, Past Chairman of the Committee on Space Biology and National Academy of Sciences, Washington. We have no summary but hear that it will be "suitable for all children aced 3-80 years". children aged 3-80 years".

For your diary: the next lecture will be on 10 April and will be given by Dr D F Chester; Director, Central Electricity Research Laboratories.

RUTHERFORD INTERMEDIATE TECHNOLOGY GROUP

The Inaugural Meeting of this group will be held in the R61 Conference Room on Wednesday,

19 March at 12.30 hours. The introductory talk will be given by Mr J A Kozlowski, Power Projects Officer,

Intermediate Technology Group.

A variety of factors have conspired to delay the formation of the Rutherford Group since it was first mooted last year; these difficulties are now past however. Two very interesting projects have been proposed for study and the group should be able to start work on them straight away. Mr Kozlowski will introduce the projects; a simple refrigerator and an 'aeolian generator' for small amounts of electric power. He will also suggest some other areas for study.

Although the meeting is primarily intended for members of the new group, anyone who is interested in hearing Mr Kozlowski's talk will be welcome to attend.

BULLETIN NOTICE

Copy for the next issue shall be sent to the Editor not later than Monday

24 March.

INTERNAL EVENTS

NIMROD LECTURE SERIES Monday 17 March 11.30 Lecture Theatre

HEP SEMINAR Wednesday 19 March 11.00 Conference Room, R61

RUTHERFORD LABORATORY LECTURE Thursday 20 March 15.15 Lecture Theatre

NIMROD LECTURE SERIES
Monday 24 March - II.00 hours
Tuesday 25 March - II.00 hours
Wednesday 26 March - II.00 hours
Lecture Theatre

RUTHERFORD INTERMEDIATE TECHNOLOGY GROUP MEETING Wednesday 19 March 12.30 Conference Room, R61 Hadron Production in Muon-nucleon Collisions

Dr C A Heusch/SLAC, CERN

On the Parity of Regge Cuts

Professor Lorella Jones/DAMPT Cambridge and Illinois

Medical Aspects of Space Flight

Professor Edward H Kass (see General News section)

How High are Higher Symmetries and ψ chology for J-walkers. (SU (2, 3, 4, 6, 8) for Experimentalists)

Dr F E Close/CERN

A Series of Four Lectures

Inaugural Meeting and Introductory Talk
Mr J A Kozlowski/Power Projects Officer, Intermediate Technology Group
(see General News section)

EXTERNAL EVENTS

MARY COLLEGE

THEORETICAL PHYSICS SEMINAR/PHYSICS LECTURE THEATRE - 16.15 hours,

17 March: Exactly Soluble Models in Statistical Mechanics - Prof R J Baxter/Canberra &

Edinburgh.

SOUTHAMPTON UNIVERSITY

THEORETICAL & HIGH ENERGY PHYSICS SEMINAR/LECTURE THEATRE C - 14.30 hours 21 March: Current Algebra at Low and High Energies - Dr D J Broadhurst/Oxford.

MANCHESTER UNIVERSITY

THEORETICAL PHYSICS SEMINAR/NIELS BOHR COMMON ROOM - 14.30 hours

19 March: Radiative Damping and Level Shifts without Field Quantisation - Prof G Series

Reading.

DARESBURY LABORATORY

DARESBURY LECTURE SERIES/LECTURE THEATRE - 14.00 hours 18 March: Title to be announced - C A Heusch/CERN, California. 25 March: The psi Particles - B Jean-Marie/SLAC, Orsay.

THEORETICAL PHYSICS SEMINAR/OLD CONFERENCE ROOM - 14.00 hours

24 March: The Pomeron, Regge Cuts, and Scaling - P D B Collins/Durham.

SUSSEX UNIVERSITY

NUCLEAR PHYSICS SEMINAR/ROOM PD | A6 - 14.15 hours

17 March: Charge-Dependent Effects in Nuclei - A M Lane/Harwell.

EVENTS AT AERE HARWELL

NUCLEAR PHYSICS DIVISION COLLOQUIUM/CONFERENCE ROOM, HANGAR 8 - 15.30 hours

20 March: Neutron Capture Studies in the Mass - 100 Region - T J Haste/NPD.

MISSING EQUIPMENT

The following items of equipment have been reported missing from the RI8 Electrical Services

Section:-

Two 15 amp Extension leads, red drum type, RL Nos. 14/2970 and 14/1418.

Anyone with information on the whereabouts of these items is asked to contact Mr A Hipwell or Mr A Wells, Ext. 573, RI8.

LOST & FOUND

At the last Rutherford Laboratory dance a pearl from an evening bag was lost & has been found. Would the owner please contact

Mrs S Fones, Ext 495, R20.

POSTAL ARRANGEMENTS AT EASTER

The last delivery of Atlas and Rutherford mail to the Post Office will leave the Post Room,

Atlas Laboratory at II.00 hours on Thursday 27 March. Mail reaching the Post Room after this time will not be taken to the Post Office until Tuesday | April.

FILM BADGE NOTICE

It is Period 3. Colour Strip -YELLOW for By films. Please check that you are wearing the

correct films and that all old ones are returned.

 $\frac{\text{Next film change}}{\text{24 March. Colour Strip - BLUE}} \\ \text{for } \beta \gamma \text{ films. Six monthly} \\ \text{TLD change for people with surnames commencing M,N,O,P.} \\$

Note Will holders of fast neutron film badges return them as soon as possible.

OVERSEAS VISITS

Dr R Taylor, to Paris, 16 - 17 March,

to attend SEAS meeting. Dr W G Williams and Mr J Penfold, to ILL Grenoble, 17 -21 March, to carry out tests on polarizing mirrors.

Mr A G Wheldon, to SLAC, Stanford USA, 17 March for

3 months. The Director, to CERN , 18 - 21 March to attend meetings of CERN Scientific Policy Committee, Restricted

ECFA, Committee of Council and CERN Council.

Dr R A Rosner, to CERN, 23 - 26 March, for discussions on control systems.

RUTHERFORD LABORATORY BULLETIN

Published by the Scientific Adminsitration Group

H F NORRIS Editor:

Deadline for

GENERAL & SOCIAL NEWS

INTERNAL & EXTERNAL EVENTS

Room 42 Building R20 Rutherford Laboratory Chilton Didcot Oxon

Insertions Tuesday 1600 Wednesday 1200

Abingdon 1900 Ext 484

Let's face it, a bolt, although of importance in the right position is still a fairly mundane piece of equipment. Or is it? The Editor is grateful to Ron Baker of the Nimrod EE & AP-Group for the following RON Baker of the Nimrod Lt & AF Group for the following article which gives some idea of the problems involved in the design of one particular type of bolt. Ron is very willing to talk to anyone interested in the subject of these particular bolts and their usage.

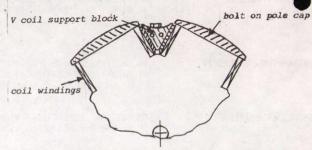
Following the breakdown caused by a "Vee Coil Support" bolt failure on a laminated pole alternator rotor in 1967, a detailed investigation of the Nimrod main power plant rotating machines was carried out. This revealed, amongst other things, that whilst these bolts were perfectly adequate for a steady state duty, they were totally inadequate for a fatiguing duty such as they encounter on the Nimrod rotors, each of which carries 60 such bolts and completes about 7½ million pulses per

A properly tightened bolt has a tension preload applied to it that is equal to or greater than the external load to be supported in service. Under this condition the bolt cannot fail by fatigue because there is no change in the stress in it regardless of the fluctuating nature of the operating load. However, in this particular situation, while it is possible to premioad the bolts, they very rapidly lose this tension because of the yeilding nature of the windings against which they are tightened. Even though solid pole rotors were just being introduced at the time of the investigation, a redesign to accommodate proper bolt pre-loading was not practical. The use of solid pole rotors in itself alleviates the bolt situation to some extent.

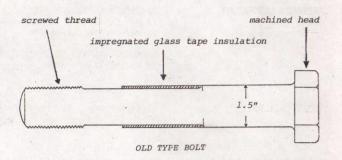
As even the bolts of the original design had survived 22 million machine pulses before a failure, it was decided to replace them with redesigned bolts. objective was to obtain the best possible bolts for this arduous duty and to justify the choice by an exhaustive programme of modification and testing in order to gain reliability confidence. The redesigned bolts possess many advantages over the originals and the specification for the new design runs to some twelve pages! This includes such techniques as micro-inclusion counting of the vacuum remelted steel from which they are manufactured in addition to detailed mechanical and nondestructive testing.

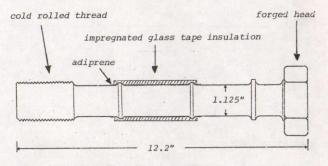
The main fatiguing stress regime seen by the bolts in the machine is the 15± $1\frac{1}{2}$ ton in -2 due to the pulsing variation of the rotational speed. In 1969 sample redesigned bolts had been tested in a fatigue rig to 100 million pulses at 20 \pm 2 tons in $^{-2}$ without failure. Nevertheless, prudence dictated that the safe operating life in the rotors should be only 30 million pulses until real operational experience had been gained.

Recently, a test series had been completed on bolts which had been removed from a rotor after 26 million pulses. These were then run for an additional 75 million pulses in a fatigue rig at 20 \pm 2 tons in $^{-2}$. a result of detailed examination of these bolts it has now been agreed with our advisers, Lloyds Register, that



new solid pole rotor - cross section





NEW TYPE BOLT

the service life of the bolts be increased to 60 million pulses.

The life extension means that no Vee bolts will have to be changed for fatigue reasons before 1978. Based on the current cost of a bolt, about £70, and the costs of unthreading large rotors this will result in a direct financial saving of at least £40,000 during the next six years with a great reduction in the considerable risk and inconvenience factors inherent in working on large

SOCIAL NEWS

INFORMAL LUNCH-TIME ORGAN RECITAL Depressing times, depressing

TIME ORGAN RECITAL weather - so we offer a little light relief in the form of an informal session of light music, both old and new played on the electronic organ (Yamaha D3) by John, who plays under the name of Jonathon! Around 12.30 on Friday. 21 March a light table of the light was a light sample of the light sample. Friday, 21 March - just drift in and out, it's very informal.

RL AMATEUR The Club station is now "on-the-air". The AGM will be held on Tuesday 25 March RADIO CLUB at 12.45 in RI5, and all those interested are welcome to attend.

CHRISTIAN FELLOWSHIP

Mrs Joannie Yoder of Reading will be visiting the Laboratory

on 21 March to give another talk on 'Neighbourhood Evangelism'. All are welcome to come along and the meeting commences at 12.30 in the R12 Conference Room.