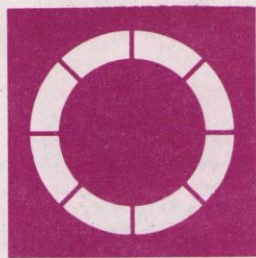


No 4/71  
5 Apr 71



Rutherford Laboratory

# Bulletin

## General News

**50 YEARS IN RETROSPECT** - At 3-30 p.m. on Wednesday, 31 March in the Conference Room R1, Frank Cullen surrounded by many friends and colleagues took his farewell of the Lab. The Secretary, Dr Valentine presented Frank with a very fine portable radio and wished him every happiness in his retirement. However to go back nearly 50 years, to 1922 when in January of that year a young Frank Cullen joined No 1 school of Technical Training (Boys) of the Royal Air Force at Halton. He was a member of the first entry of Tranchards famous Apprentice Scheme and on completion of his 3 year course was posted to the RAF No 5 Flying Training School of Sealand in Cheshire as Aircraftsman carpenter/rigger working on wooden aircraft. During this early period he worked on such famous planes as the Sopwith Snipe, Bristol fighter and De Havilland 9 As. Following a year at RAF Bircham he completed his 10 year engagement at the RAF No 2 Flying Training School at Digby Lancs where he recalls looking after Whittle's (later famous for his Jet engines) two aircraft which were Avro 504 K's, with rotary engines.

Following a period of unemployment after leaving the RAF, Frank worked for a spell as a market gardener. At the end of 1934 he became a joiner in the building trade, working for ninepence an hour. To earn this he had, for example, to lay all the wooden floors in a two storey house, level his own joists and carry his own timber and complete the job in one day. He soon got the sack as he was a wee bit slow and put too many nails in the floor boards. However it was all for the best as he immediately joined the famous firm of Percival Aircraft who at that time employed 40 people making such planes as the Gull, a cabin monoplane, which was years ahead of its time, and the Mew Gull. As he remembers, one started with a bulk of timber and ended with a finished aircraft. He also remembers that it was only necessary to give 2 hours notice to leave a job (or get sacked), the 2 hours being allowed to sharpen your tools before you left. Oh yes, by that time he was earning 1/3 an hour.

The next change he made in 1934 was to reengage in the RAF. Significantly his first posting was to the Oxford Univ Air Squadron (OUS) at Abingdon. In the OUS at that time were students whose names were to become famous such as Group Captain Cheshire VC, Prince Obolensky (a noted rugby player) and John Profumo. He stayed at Abingdon until Oct 1940 going from LAC to Sergeant. After a number of wartime postings he arrived in September 1942 at No 15 Operational Training Unit Harwell as a Flight Sergeant moving to No 10 OTU at Abingdon in June 1944. Here and at other stations he was concerned with gliders and eventually arrived back at RAF Abingdon in 1949 where he was discharged on fulfilment of his engagement having spent, over 24 years in the Service. Frank then started a new career, for after passing the Civil Service examinations he joined the ministry of Supply AERE Harwell as a Clerical Officer in Progress and General Administration, Reproduction Section where he stayed for 8 years. In May 1957 he joined the Winfrith Group but based at Harwell visiting the new site before a peg was in the ground. After being involved in general admin duties Frank moved over to the Rutherford Lab., in Sept 1958. He joined the Admin Section bringing the strength up to 3. His subsequent activities are well known to most people at the Lab and as he remarks it was often hard work in the early days, a 7 day week being a common occurrence. Outside his official duties he was a founder member of the Abingdon Branch of the National Cactus and Succulent Society and has been associated with AERE Hort. Soc since his arrival in 1949.

Before making the presentation, Dr Valentine, commenting on the notes prepared for him on Frank's career said he was most impressed by the last sentence - "Frank will be receiving 4 pensions" adding "Its nice to meet somebody who is rich".

We are sure his many friends and colleagues who were unable to be present on Wednesday will join with us in wishing Frank a long, happy and, it appears, a busy retirement.

**BULLETIN NOTICE** - This issue covers two weeks. Items for inclusion in the next issue, No 15/71 dated 19 April should be sent to the Editor, Room 42, R20 not later than Wednesday, 14 April and if possible by Wednesday 7 April.

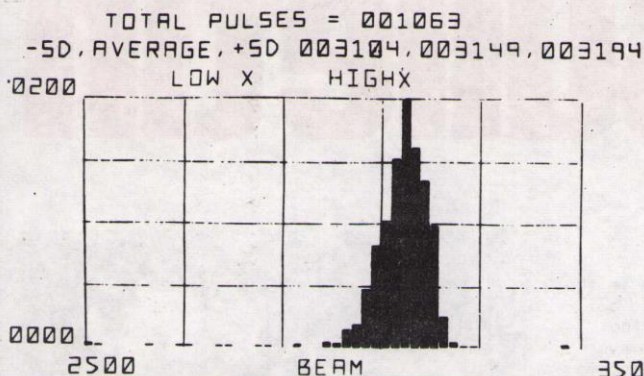
**LIBRARY NOTICE** - The publication, "Recent References in Cryogenics and Superconductivity" is issued approximately fortnightly by the library. Members of staff who now receive this list but no longer require it and members of staff who would like to receive it, are asked to contact the Librarian on Ext 6668.

**THE 1971 PHYSICS EXHIBITION** - The Laboratory is entering five exhibits for this year's exhibition - The Gas Purification Rig, The Mono-Energetic Electron Source, Foil Stretching Technology, The Heat Pipe and its Application to the LH<sub>2</sub> Target and, Television Cameras Working in High Magnetic Fields. The Exhibition will be held from 19-22 April 1971 inclusive at Alexandra Palace, North London. Tickets are now available from the Editor.

**NATIONAL SAVINGS CERTIFICATES - MONTHLY CYCLE ENDING 31-3-71.** - Certificates can now be collected from the Cash Office, R20. New members wishing to join the scheme can obtain enrolment forms from the Cash Office. Forms must be returned not later than 7 April 1971.







NIMROD IN FINE FETTLE - After a rather unsettled period since the annual shut-down, Nimrod is now in fine fettle. The computer acquired histogram shown on the left is of a 'typical' beam intensity distribution obtained on 25 March. At that time the average circulating beam was  $3.15 \times 10^{12}$  proton/pulse and the standard deviation of the intensity distribution was  $4.5 \times 10^{11}$ . There are 1063 beam pulses in this histogram so it represents about one hour of operating time. This is the first occasion on which  $3 \times 10^{12}$  proton/pulse have been accelerated in Nimrod at full repetition rate (20 pulses/min).

The programme in the Main Control Room (MCR) PDP8 computer which was used to collect this data is one of the new time-sharing routines, which run as priority interrupt routines.

This time sharing system was introduced during the annual shut down and enables the MCR crew to run several programmes 'simultaneously' in the computer. The histogram

is displayed on a Tektronix 611 oscilloscope and relayed to the MCR desk by closed circuit television. The picture is built up pulse by pulse on-line till one bin is full. The computer then analyses the histogram writes the answers at the top of the picture and the programme ends automatically. A Histogram of any of the available internal or external beam monitors can be displayed, or the ratio of any two of the monitors. The execution time of the programme is 100 m.sec for beam pulse.

HALL 3 NEWS - P.M. ON THURSDAY - News has just been received that beams have been successfully transported to the second target station, X3X in Hall 3.

CHAIRMAN ON TELEVISION - Sir Brian Flowers will be appearing as one of the judges in the final of the "Young Scientist of the Year" programme at 6.20 p.m., Monday 5 April, B.B.C.I.

SITE EMERGENCY KLAXOMS - will be sounded, for a reliability test, at 10 a.m., on Tuesday 6th April. The sounding sequence will be: All clear - an uninterrupted note for 10 seconds : Silence for 10 seconds : Warning - a rising and falling note for 30 seconds : Silence for 10 seconds : All clear - an uninterrupted note for 10 seconds.

Notice boards announcing the sounding will be posted at the North-East entrance to the Site from p.m. Monday 5th April, 1971, until after the test has been completed.

Building Wardens are asked to report on the audibility and efficiency of the klaxons to Mr D C Rance, Building RI (ext 512)

FILM NOTICE - It is Period 4. Colour Strip BROWN for  $\beta\gamma$  films and fast neutron packs. Please check that you are wearing the correct dosimeters and all old ones are returned.

Would people wearing the blue monthly  $\beta\gamma$  films please check that their holders are in good condition. If there are any filters missing or they are very dirty please contact Mrs Coates Ext 430 for a new one.

OVERSEAS VISITS - Dr G Ringland, to Israel, 3 - 12 April to attend International Conference on Duality and Symmetry in Hadron Physics. Dr A Bryden and Dr A Oxley, to CERN, 4 - 6 April to attend Conference on Minimum Guidance. Mr R T Elliott, to CERN, 4 - 7 April for discussions. Dr G W Reginald, to CERN, 5 - 23 April, to work on the  $\bar{p}p$  experiment. Mr P Barker and Mr H Wroe to Liege, 5 - 7 April to attend S68 Meeting. Mr R T Elliott, Mr I H Payne and Mr M T M Glore, to CERN, 14 - 18 April, for work on the Lamda Hyperon Experimental equipment.

The following will attend the International Conference on Meson Resonances and Related Electromagnetic Phenomena, Bologna, 14 - 16 April - The Director, Dr T C Bacon, Dr J J Phelan, Dr N H Lipman, Dr I F Corbett, Dr R C Hanna and Mr D Morgan. Drs Hanna and Corbett will also visit CERN for discussions on 19 - 20 April and Mr Morgan will spend 3 weeks in Paris at the Faculte des Sciences.

Dr T G Walker, to Rome and CERN, 16 - 19 April for discussions.

## Machine Schedules

NIMROD Cycle 4 (6.4.71 - 27.4.71) Machine Physics : High Energy Physics.

Team	Beam	Experiment	
Westfield Coll/RHEL	X3/ $\pi^8$	Measurement of the Asymmetry of Eta Decay	Setting up
Surrey U/B'ham U/RHEL	$\pi^{10}$	Total Reaction Cross-Section for Pions on Nuclei	Data
B'ham U/RHEL	X2/K12A	$K^+$ Elastic Scattering and $K^+n$ charge Exchange from 0.45-0.95 GeV/c	Data
RHEL	X3/ $\pi^{11}$	Low Momentum Pion Beam Studies	Setting up
Oxford U	K10s	Study of Neutral States in $K^+p$ Reactions	Setting up
RHEL/Durham/UCL/CERN	X1/K9	Setting up of K9 for 4GeV/c $\pi^+$ for Proposal No 91	

## Internal Events

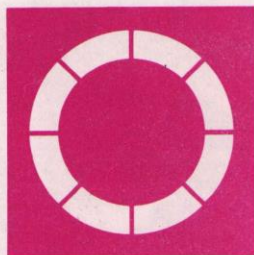
Tues, 6 Apr 11.30 a.m. Lecture Theatre	Special Nimrod Lecture	Prof S Flatte (Berkeley)	Search for Structure in $2^+$ Octet.
Wed., 7 Apr., 11 a.m., Conf Rm., RI	HEP Disc Group	Dr L Lyons (Oxford)	B5 Phenomenology for $K^+p$ Interactions
Wed., 14 Apr 11 a.m., Conf Rm., RI	HEP Disc Group	T P Shah (RHEL)	Diffraction Processes in 16 GeV/c $\pi p$ Interactions

SOCIAL NEWS held over owing to lack of space. See blackboard in Coffee Lounge for details of some events.

Rutherford Laboratory	2.3.71	H F NORRIS	Ext 484	Scientific Admin Group R20
-----------------------	--------	------------	---------	----------------------------



No 15/71  
19 Apr 71



# Rutherford Laboratory Bulletin

## General News

### SUPERCONDUCTING APPLICATIONS GROUP AWARDED BRITISH CRYOGENICS COUNCIL PRIZE

The British Cryogenics Council prize for the most significant development in low temperature technology in the period 1969-70 has been awarded jointly to teams at the Rutherford Laboratory and Imperial Metal Industries, for the development of the twisted filamentary superconducting composites which have made possible the construction of reliable superconducting coils for both dc and pulsed applications.

During 1968 a collaborative programme between RHEL and IMI pursued simultaneously the theoretical behaviour of such composites, the fabrication of a wide range of sample quantities, the experimental verification of their behaviour, and the development of large scale production techniques. This culminated, in 1969, in the commercial availability of the first materials of this type and the demonstration of their satisfactory behaviour in superconducting coils. Following this lead, the vast majority of superconducting composites being manufactured and utilised throughout the world are now of the twisted filamentary form.

Further work is now in progress to produce the most advanced possible conductor of this type for use in prototype superconducting synchrotron magnets, which it is hoped will eventually enable the energy of the new European synchrotron to be increased to 1000 GeV.

The award was made on 5th April at the International Cryogenics Exhibition, and was received on behalf of the Rutherford Laboratory team by M N Wilson, who made the most significant individual contributions to the work, particularly in its early formative period.

**MISSING EQUIPMENT** - The following item of equipment has been reported missing from Lab G3/G4.

Tektronix Type D Plug-in-Unit Ser No. 100524, Labelled MP(H)90

Anyone with information of the present whereabouts of this item is asked to contact J V Smith, R2, Ext 373.

**RUTHERFORD LABORATORY LECTURE** - The next lecture in this series "The Astronomy of Rare Events on Short Time-Scales" will be given by Dr J V Jelley, Head of the Miscellaneous Research and Cherenkov Radiation Group of the Nuclear Physics Division at AERE Harwell. John Jelley is well known to many people at the Laboratory. At one time he was head of the Cosmic Ray Group at Harwell. The main theme of the lecture is to demonstrate that by suitable choice of techniques and with relatively simple and inexpensive ground-based installations, it may well be feasible to detect exceedingly short bursts of prompt radiations from catastrophic events, such as must occur from supernovae and collapsing stars. More specifically the lecturer will describe the current experiments in the radio, microwave, optical as well as the X-ray regions of the spectrum, aimed at detecting pulses of electromagnetic radiation that might be expected to accompany the gravitational radiation reported by Weber in the U.S.A.

**FILM NOTICE** - Period 5 commences on Monday, 19 April. Colour-strip purple for Bx films and fast neutron packs. Six-monthly TLD change for people with surnames commencing Q,R,S,T. Please change your dosimeters promptly.

**OVERSEAS VISITS** - Messrs N M King, G H Rees and M R Harold to Saclay 17-20 April to attend meeting of GESS Working Group.

**NATIONAL PHYSICAL LABORATORY - OPEN DAYS 1971** - will be held on 11, 12, and 13 May, when exhibits of the Measurement Group will be on display. A booklet containing descriptions of exhibits is held by H Norris, R20, Tel 484 to whom applications for admission tickets should be made as soon as possible.

## Machine Schedules

NIMROD Cycle 4 (6.4.71 - 27.4.71)

Machine Physics: High Energy Physics (X3/ $\pi$ 8,  $\pi$ 10, X2/K12A, X3/ $\pi$ 11, K10s, and X1/K9)

Full details of Cycle 4 were given in Bulletin No 14/71.

## Internal Events

Mon 19 Apr., 11.30 a.m., Lecture Theatre	Nimrod Lecture Series	Dr G A Ringland (RHEL)	Report on Phenomenology Conferences at Cul-Tech.
Wed., 21 Apr., 11 a.m.,	HEP Disc Group	Dr G A Ringland	Tel-Aviv Conference Report.
Thurs., 22 Apr., 3.15 pm. Lecture Theatre	Rutherford Laboratory Lecture	Dr J V Jelley (AERE)	The Astronomy of Rare Events on Short Time Scales.
Fri., 23 Apr., 11 a.m., Conf.Rm., R12	Seminar in Computing	P H Sharp	A User's Experience of Cyclops.



Fri., 23 Apr., Lecture Theatre. One day Meeting on "Stabilizing Superconductors - Modern Methods and Present Problems" Coffee at 10.30 a.m., Meeting commences at 11.00 a.m. Further details from Dr D Thomas, R25, Ext 6660.

Mon., 26 Apr., 11.30 a.m., Nimrod Lecture Series Dr A Brody (CERN)  
Lecture Theatre

Partial Wave Analysis of the Reactions  
 $\pi p \rightarrow \Delta^+ \pi$ ,  $K p \rightarrow Y^* \pi$  up to 2 GeV.

## External Events

Tues 20 Apr., 7.45 p.m.,  
Univ of Reading

British Computer Soc.,  
Branch Meeting

Dr P C Poole (Culham  
Lab)

Production of Portable Software.

## Social News

CHESS TOURNAMENT 1970/71 - For the fourth year running Bill Turner is the winner with 10 points out of a possible 11., and once again not losing a single game although on two occasions this record looked in danger. Alan Gilby in his first year in the tournament put up a fine performance coming second with 9½ points. Third place went to Noel Stewart who for the fourth time has been placed in the top three. Good performances were put up by Subadh Chanda, Jim Padley and Martin Evans who finished joint fourth. Bill Turner will be presented with his prize, a chess book (Modern Chess Openings) shortly.

Peter Craske wishes to thank all the players for their co-operation in running the tournament and in particular to congratulate Bill on his fine win.

FOOTBALL RESULTS HELD OVER FROM PREVIOUS WEEK.

SUNDAY FOOTBALL. RHEL 3 - Didcot "The Sprat" 5.

The second defeat of the season for the Lab team and it appears one at which the sporting aspects were sadly lacking.

SIX-A-SIDE FOOTBALL LEAGUE CUP.

24 March R25 - 3, Transport 2. A new look Transport team who were unlucky to lose especially as Roy Cotton in the Transport goal brought off a good save from a penalty.

25 March. DO - 4, R36 - 3. Almost a non-event, the play reflecting the relative positions of these two sides in the League.

26 March. Nimrod - 1, Hall 3 - 1. A real top of the table clash, with good attacking football, with a draw as a fair result.

CHRISTIAN FELLOWSHIP. - All welcome to come along to the meeting in the R12 Conf Rm., at 12.30 p.m., on Friday, 23 April.

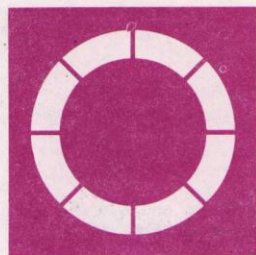
Rutherford Laboratory  
15-3-71

F HARDEN Ext 6114  
Scientific Admin Group  
Building R20

SAW



No 16/71  
26 Apr 71



# Rutherford Laboratory Bulletin

## General News

**SEMINAR ON SUPERCONDUCTING SYNCHROTRONS.** - A Seminar on Superconducting Synchrotrons is to be held at The Cosener's House, Abingdon from Monday to Wednesday 26-28 April. About thirty visitors from abroad will be attending this seminar which is by invitation only. On Thursday morning, 29 April the participants will visit the Rutherford Laboratory. At 3.15 pm on the same day Dr G K Green, Brookhaven will give a talk in the Lecture Theatre entitled "Prospects for Superconducting Synchrotrons". Although this talk will not be a summary of the seminar it will be linked with the discussions that will have taken place earlier in the week.

**FOUND** - A Parker fountain pen has been found in Building R1. Would the owner please contact Mr J Marshall, R1.

**NATIONAL SAVINGS CERTIFICATES - WEEKLY CYCLE ENDING 30.4.71.** - Certificates can be collected from the Cash Office, R20, from 3.5.71 onwards. New members wishing to join the scheme can obtain enrolment forms from the Cash Office. Completed forms must be returned not later than 5 May 71.

**FILM NOTICE** - It is Period 5. Colour Strip - PURPLE for  $\beta$  films and fast neutron packs. Please check that you are wearing the correct films and that all old films are returned.

**MESSAGE OF THANKS.** Frank Cullen would like to thank all those who so kindly contributed to his farewell gift and apologises to those he was unable to see before leaving.

### EXTERNAL CONFERENCES SYMPOSIUMS FORMS ETC

26 Apr 71	-	"The Mathematics of Operational Research", at UCL London
14-15 May 71	-	"Biomedical Applications of the Pion Beam from the 590 MeV Isochronous Cyclotron," at Zurich
18 May 71	-	"Management Information Systems," at Imp Coll London
18-20 May 71	-	"Interactive Computing," London (also 1-3 June, Amsterdam)
25-27 May 71	-	"Multics and Project Mac", at London
15-17 June 71	-	"Software Engineering," at London
13-15 July 71	-	"Partial Differential Equations and Distributed Parameter Control Systems," at Univ of Warwick
8-13 Aug 71	-	"Amorphous and Liquid Semiconductors", Ann Arbor, USA
14-17 Sept 71	-	"First European Conference on the Physics of Condensed Matter", at Florence (Special emphasis on Metals and Phase Transformations).
27-29 Sept 71	-	"Teaching Mathematics to Non-Specialists", at Loughborough Univ.

Further details on all of the above can be obtained from the Editor.

**SUGGESTION AWARDS.** - At a recent meeting, seventeen suggestions were considered by the Awards Committee and the following awards were approved:-

G McGee	)					T Morgan	ESD	R9	£3
A Smith	)	Joint	NED	R43	£60				
B Holcroft	)					C Gascoigne	ESD	R9	£3
D Woods			NED	R43	£15				
F Macavoy			NED	R3	£5	D Bartholomew	Apprentice		£3

**OVERSEAS VISITS** - Dr J J Phelan and Dr R J Miller, to the USA, 25 April - 6 May. Both will attend the American Physical Society Meeting in Washington and Dr Phelan will also visit ANL and NAL.

Dr G R Stevenson, Mr R C Hack and Mr D L Perry, to CERN, 25 April - 1 May to attend International Conference on Protection against Accelerator and Space Radiation.

Mr H Wroe and Mr P Barker to ESTEC, Holland, 27 April and 27-28 April respectively, to attend S2/68 Meeting.

## Machine Schedules

NIMROD Cycle 5 (27.4.71 - 18.5.71)  
Machine Physics  
High Energy Physics

Team	Beam	Experiment	
Westfield Coll/RHEL	X3/ $\pi$ 8	Measurement of the Asymmetry of Eta Decay	Data
Bristol Univ/RHEL	X3/K $\pi$ 5	K $\pi$ Differential Cross-Sections from 1.07 - 2.0 GeV/c	Data
RHEL	X3/ $\pi$ 11	Low Momentum Pion Beam Studies	Setting up



B'ham Univ/RHEL	X2/K12A	$K^+n$ Elastic Scattering and $K^+n$ Charge Exchange from 0.45-0.95 GeV/c	Setting up
RHEL/Durham/UCL/CERN	X1/K9	Setting up of K9 for 4 GeV/c $\pi^+$ for Proposal No 91	Setting up/ Data
Oxford Univ	K10s	Study of Neutral States in $K^-p$ Reactions	Setting up
Surrey Univ/B'ham U/RHEL	$\pi$ 10	Total Reaction Cross-Sections for Pions on Nuclei	Data
RHEL	P71	Apparatus Development	Data

## Internal Events

Mon., 26 Apr., 11.30 am., Lecture Theatre	Nimrod Lecture Series	Dr A Brody (CERN)	Partial Wave Analysis of the Reactions $\pi^+p \rightarrow \Delta^+ \pi^+$ , $K^+p \rightarrow Y^* \pi^+$ up to 2 GeV.
Mon., 26 Apr., 2.30 pm.,	Proposed Lectures	1. Proposal No 94: "A proposal for a $\Xi^*$ Experiment in the Omega Spectrometer at CERN", lecture by Dr J Gallivan, Imperial College. 2. Proposal No 93: "A Study of the Mass Spectrum of $X^0$ in the Reaction $\pi^+p \rightarrow X^0 + \pi^+$ neutrals at CERN, lecture by Dr G Conforto, RHEL.	
Wed., 28 Apr., 11.00 am., Conf., Rm., RI	HEP Disc Group	J Dash (DAMTP)	Regge Slopes and the ABFST-Model.
Wed., 28 Apr., 1.15 pm., Thurs., 29 Apr., 12.40 pm., Lecture Theatre	Film Show	"A Beginning Without End", a 30 minute, colour film from the USAEC.	
This 1968 film summarizes the wide variety of nuclear research and development work undertaken at the Berkeley and Livermore sites of the Lawrence Radiation Laboratory. It covers the work of the late Dr Ernest Lawrence on the invention and development of the cyclotron, post-war work using particle accelerators, research into photo-synthesis studies in superconductivity etc.			
Thurs., 29 Apr., 3.15 pm., Lecture Theatre	Special Lecture	Dr G K Green (Brookhaven)	Prospects for Superconducting Synchrotrons (see Gen News)
Mon., 3 May 11.30 am., Lecture Theatre	Nimrod Lecture Series	Madame M Gaillard (CERN)	Leptonic K Decays.

## External Events

Thurs., 29 Apr., 3 pm., Univ of Cambridge	Theor. HEP Seminar	Dr G Shaw (Daresbury)	Title to be announced.
Thurs., 29 Apr., 4.15 pm., Clarendon Lab., Oxford	Theor Phys. Seminar	Dr I J R Aitchison	Nucleon Structure from Inelastic Electron Scattering
Thurs., 29 Apr., 7.30 pm., Univ of Reading	IERE Meeting	P Atkinson and A J Allen (Reading U)	Direct Digital Control - The Case for the Special Purpose Computer.
Fri., 30 Apr., 2.30 pm., Clarendon Lab., Oxford	Elementary Particle Theory Seminar	Prof H Lehmann (Hamburg)	Perturbation Theory for a Class of Non-polynomial Lagrangians.
EVENTS AT AERE			
Tues., 27 Apr., 2 pm., Lecture Rm., Bldg 8.9	Theor. Phys. Seminar	Prof S Lundqvist (Sweden)	The Story of the Elusive Atomic Plasmon
Thurs., 29 Apr., 3.30 pm., Conf., Rm., H.8	Nucl. Phys. Colloq	Dr A H Gabriel (Culham)	Solar Ultra-Violet Spectroscopy

## Social News

CHRISTIAN FELLOWSHIP - Everyone welcome to come along, to the R12 Conference Room at 12.30 pm., on Friday, 30 April, when the Rev. E Atkins, Rector of Harwell will be leading the meeting.

RECORDS SOCIETY - 12.40 pm., Tuesday, 27 April, Lecture Theatre.

Brahms Symphony No 3 - a stereo recording (Sorry, no more details at time of going to press)

Rutherford Laboratory  
23.4.71

SAW

H F NORRIS Ext 484  
Scientific Admin Group  
Building R20

STOP PRESS - Thurs., 29 Apr., 8.30 pm., Seminar in Elemt. Part. Phys. Prof M Ross (Westfield on leave from Michigan) Some Problems about Inelastic Body Reactions.