RUTHERFORD

Bulletin 5

7 - 21 March 1977

They Want Your Blood – But Why?

The Oxford Regional Blood Transfusion Service Unit will be paying its six monthly visit to the Rutherford Laboratory on 14 and 15 March. They want blood from as many of you as possible. What is this substance called blood and why do they need so much?

A Little History

Ancient Egyptians used blood baths for resuscitation and recuperation and the Romans were said to have rushed into the gladiatorial arena to drink the blood of dying victims to rejuvinate themselves. Probably the blood was taken by mouth rather than by vein and therefore had very little beneficial effect.

Pope Innocenti VIII in 1492 was supposed to have received blood from three young men to bring him out of a state of coma but to no avail. Not only did he succumb promptly but so did the young men.

In 1628 William Harvey announced his theory of the circulation of blood and this made transfusion possible, the first authenticated report is that of Richard Lowe who made a successful transfusion in 1664, using animal blood.

Following several successful experiments in Paris a further one was fatal and the resulting long legal battle (although the physician was exonerated of murder) produced such an outcry that transfusion was banned in France. Shortly afterwards Parliament banned it in England as did the magistrates in Rome.

Not until the early 19th century was it once more considered in England and by the 1870s transfusions were performed with increasing frequency, animal blood being used in a number of cases. Lack of knowledge on blood groups and therefore incompatibilities resulted in some severe reactions and increased fatalities.

The answer came in 1900 when Karl Landsteiner a Viennese physician discovered that human blood devided into three main groups, A, O & B (a fourth group, AB, came later). In different parts of Britain the percentages of these four groups show slight variations but when countries or continents are compared, the differences can be very large as shown in the following table.

	BLOOD GROUP			
	O	A	B	AB
English	47	42	8	3
Welsh	49	38	10	3
Scots	51	35	11	3
Irish	54	32	11	3
Gypsies in Europe	31	27	35	7
Indians	33	24	34	9
Maoris (Polynesians)	40	56	3	1
Blackfoot N American Indians	23	76	0	1
Most S American Indian Tribes	100	0	0	0

The distribution in the British Isles is interesting as it is thought that the early inhabitants were largely of group O and that their descendants retreated to the north and west before the Anglo-Saxon invaders who possessed a much higher percentage of group A.

Blood

Blood consists of a pale straw coloured fluid called plasma in which there are suspended, three main kinds of cells; red (to carry oxygen), white (to fight disease) and platelets which participate in clotting and so help to stop bleeding.

Each adult body contains 6-10 pints of blood (with some 2½ million million red cells and 2500 million white cells) which is pumped round the circulating system at a rate of 10 pints per minute, rising to 30 pints during brisk exercise, through 60,000 miles of arteries, veins and capilliaries. The latter - tiny tubes servicing the bloodstream - have a total surface area that would cover a 1 acre field. Not all these capilliaries are opened at once, otherwise all the blood in the body would drain into them within seconds, like flood water into a swamp.

Surprising? Not really when you realise that each living cell (which carries all the chemicals necessary for its own function), has to have access to this blood. All the materials each cell needs, must be carried to it, and all those it discards must be removed, via the blood, to the excretory organs.

Valuable stuff blood, spill one drop and you have lost 250 million red cells (their life cycle is about 127 days),400,000 white cells (some with a life cycle of only 12 hours),15 million platelets and of course some plasma.

Blood Groups

There are four main groups - AB, A, B and O; each group is also either Rh (Rhesus) positive or Rh negative. With few exceptions a patient should receive blood of his/her own blood group otherwise a reaction - possibly fatal - could occur.

As well as the ABO system there are many other classifications, some indicated by letters of the alphabet, others by contractions of the name of the person in whom they were first identified, eg, Fy (Duffy), Le (Lewis) etc.

Sophisticated techniques have been developed for the detection of rare blood groups and publicity is periodically given to the donors of 'very rare groups', ie donors whose red cells lack a very common antigen. To put this into perspective, during a recent 12 month period, only 9 out of 750,000 donations for transfusion were for patients with rare blood groups (with antibodies to antigens.).

The red cells and plasma are used in identifying blood groups. A group 'A' donor has on his red cells a substance called the antigen; a group 'B' donor - B antigen; group AB have both A and B antigens while group 'O' has neither. These antigens can be identified by their reaction with two antibodies (Anti-A and Anti-B) which exist in the plasma normally occuring in the plasma of persons whose red cells lack the corresponding A or B antigens, produced by the body's defence mechanism. The main feature of the antibodies is that they will cause red cells containing the appropriate antigen to aggregate and if strong enough, may destroy the cells completely. The following table shows these reactions.

	Group AB	Group A	Group B	Group O
With anti-A	clumping	clumping	-	-
With anti-B	clumping	-	clumping	-

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INTERNAL EVENTS

NIMROD LECTURE THEATRE

The lecture on Monday, 7 March has been cancelled.

THEORETICAL PHYSICS LECTURE
Monday 7 March
1500
R61 Conference Room

Domains, Droplets & Instantons (Solitons in LGWL Theory). (Polyakov, Zinn-Justi Langer; Siegert et al.; Krumhansl & Schrieffer; Dashen, Ma & Ramachandran).

R C Arnold/Argonne & RL

SPECIAL HEP SEMINAR
Tuesday 8 March @ 1100
R61 Conference Room

Muonium and Muonic Atoms

Professor Vernon W Hughes/Yale

HEP SEMINAR
Wednesday 9 March @ 1100
R61 Conference Room

Particle Exchange in Exotic Channels at Low Energies

N Collingham/Bristol

HEP DATA HANDLING GROUP SEMINAR
Wednesday 9 March @ 1330
R61 Conference Room

Progress Report on the Hardware Aspects of the R36 Special Purpose Processor

J Javoslawski, C Maclean, G McPherson/RL

FILM SHOW
Friday 11 March
1240
Lecture Theatre

Two films being shown in conjunction with the visit of the Blood Transfusion Unit.

1. Blood is Red all over the World - this film was made by the International Red Cross. It emphasises that blood is universal to mankind, irrespective of colour or creed; that the ills which beset us, beset all men and that the cures are the same. It also shows very dramatically, that there is a continuing need for blood everywhere.
2. Thames Television - Magpie programme. - The main reason why people who are able to give blood, do in fact, not do so, is fear of the unknown. Blood is usually only seen when it is shed, and therefore has conotations of pain and suffering. Many people have an almost pathological fear of needles. Both of these factors are present in blood donating. People think that giving blood hurst, and will make them ill. NEITHER IS TRUE. This film goes a long way to dispel some of these doubts. It shows Tony Bastable giving his first donation, and it also shows him still alive at the end, and unhurt.

USERS MEETING
Monday 14 March
11.30
Lecture Theatre

11.30	Funds and Manpower for the Particle Physics Programme 1977/78.	J J Thresher
12.00	Five Year Forward Look	W E Burcham
12.45	CERN Users Association	J D Dowell
14.00	Life and Experinece at Fermi Laboratory	N E Booth
14.30	States of the SPS Experimental Programme	I Butterworth

PARTICLE PHYSICS EXPERIMENTAL SELECTION PANEL - OPEN MEETING
Tuesday 15 March
11.00
Lecture Theatre

Proposal No 194: A Study of Large Transverse Momemtum Phenomena at the ISR, CERN/ Copenhagen/Lund/RL Collaboration, Talk by M G Albrow/RL.

Proposal No 195: (at 11.45 hrs) A Proposal to Measure Neutron Spin Rotation due to Coherent Parity Violation Effects in Neutron-Neuleus and Neutron-Electron Weak Interactions. Sussex U./Harvard U/Euraton CCR - Ispra/ILL Grenoble/Oak Ridge NL/RL. Talk by J M Pendlebury/Sussex.

HEP SEMINAR
Probably 1400 Tuesday 15 March but if speakers arrangements allow, 1100 Wednesday 16 March.
Lecture Theatre.

The Quark-Lepton Connection

Professor Haim Harari/Weizmann Institute
(see 'TODAY' notice boards for date and time).

Recent Advances

The last few years have seen striking developments in the use of blood components, for example:- WHOLE BLOOD to restore blood volume after severe haemorrhage; CONCENTRATED RED CELLS to correct anaemia; WASHED RED CELLS to remove antibodies and plasma; FROZEN RED CELLS for preservation for long periods at very low temperatures (only possible on small scale); PLATELETS whose absence causes bruising and internal bleeding, transfusion can rectify the situation; DRIED PLASMA for long term storage; PLASMA PROTEIN FRACTION a purified plasma product in liquid form; FACTOR VIII PREPARATIONS which have revolutionised treatment of haemophilia; FROZEN FRESH PLASMA for correcting a variety of bleeding disorders.

This then is what happens to your donated blood which in this area has two major users, the Radcliffe Infirmary, a major centre for heart surgery, and the Churchill Hospital where the National Centre for Haemophilia Research and Treatment is located. The haemophilic centre in particular needs vast quantities of fresh plasma for FACTOR VIII preparations - 1000 donations per week!

The Regional Transfusion Centre is responsible for an area within a 60 mile radius of Oxford and its five Mobile Teams run some 1100 donor sessions each year, collecting over 100,000 donations of blood.

One of their teams is visiting the Lab on 14 & 15 March so just turn up at Building R15 anytime between 10-12 or 1330-1500. Give ½ hour of your time, about ¾ pint of your blood and you get tea and biscuits, lose a bit of weight and have the satisfaction of knowing that you will be instrumental in saving a life.

Two films are being shown in the Lecture Theatre on Friday 11 March and details are given in 'Internal Events'.

In March 1975, 148 RL people gave blood; in September 1976 the number had grown to 193 including 22 new donors. Lets try and boost these figures in this most worthy of causes.

EXTERNAL EVENTS

ELEMT PART THEORY SEMINAR/NP LAB, OXFORD - 1430 hrs.
11 Mar : Dr F Halzen/Wisconsin & RL - Study of Weak Interactions with hadron storage rings

HEP SEMINAR/CAVENDISH LABORATORY, CAMBRIDGE - 1500 hrs.
9 Mar : N Booth/Oxf - High energy muon scattering at Fermilab (postponed from 2 March).

HEP SEMINAR/DEPT APPL MATHS & THEORY PHYS CAMBS - 1500 hrs.
10 Mar : I Hinchliffe/Oxf - Scaling violations, asymptotic freedom and the Drell-Yan process.
15 Mar : Dr t'Hoof/Utrecht - Instantons.

THEOR PHYS SEMINARS/MANCHESTER UNIV - 1430 hrs.
9 Mar : Prof R London/Essex - Photon coherence & non-linear optics.
16 Mar : Dr G Karl/RL & Guelph - Parity violations in atoms and all that.

HEP SEMINARS/MANCHESTER UNIV - 1415 hrs.
10 Mar : C Barker - Pion decays in gauge theories.

PHYSICS DEPT COLLOQUIUM AT READING UNIV - 1700 hrs.
14 Mar : R E Beddoe - Studies of defects and imparities in silicon by diffuse neutron scattering.

THEOR & HEP SEMINARS AT SOUTHAMPTON UNIV - 1430 hrs.
11 Mar : Dr R K Ellis/IC - The $\Delta I = \frac{1}{2}$ rule & right-handed currents.
18 Mar : Dr R J Cashmore/Oxf - e^+e^- at PETRA and beyond.

THEORETICAL PHYSICS SEMINARS/CONF RM, BLDG 8.9, AERE - 1415 hrs.
11 Mar : Dr A Bishop/QMC - Aspects of recent non-linear physics (Solilons?),
18 Mar : Dr I P Grant/Oxf - Relativistic ab initio studies of ionisation potentials in uranium ions.

SRC GOLF TOURNEY

The 1977 SRC Inter Establishment Golf Tourney is being organised by London/Swindon who have arranged to play the fixture at the St Pierre Golf and Country Club, Chepstow, Gwent on Friday, 24 June. As is the case with virtually every enjoyable function costs are increasing but we are informed by the organisers that the charge per head should be approx. £9.50, with the possibility that this might be reduced.

The St Pierre Club is a fairly new complex but has already established itself as a major tournament venue for the Professional circuit and the facilities include, apart from two 18-hole and one 9-hole golf courses, such things as squash courts, swimming pool, badminton etc. Chepstow is easy of access being within a mile of the first exit from the M4 after crossing the Severn Bridge.

As usual the Brian Flowers Trophy will be competed for by teams of 6 - each establishment being limited to two teams - the best four net scores for the day in each team to count. There will be individual prizes in addition to the main Trophy.

Will those golfers in the Laboratory who are current holders of a handicap, either Club or Society, and who wish to be considered for the defence of the Trophy which we won so resoundingly last year, please contact either Brian Parkinson, R35, extension 566 or John Jenkins, R20, extension 475 as soon as possible.

TEMPORARY CLOSURE OF WHITE ROAD

The date of the closure of White Road to allow the construction of a roundabout near Chilton Village, as announced in Bulletin No. 4 has been changed to 7 March.

MISSING EQUIPMENT

The following item of equipment has been reported missing from the Nimrod Injector area:-

Low resistance Ohm meter Ser. No. 1069687

Anyone with information on the present whereabouts of this item is asked to contact E W Kendall, R2, Extension 366/568.

The following item has been reported missing from R25.

Sangamo-Weston millivoltmeter, Type S-82, Ser No AO86774. Anyone with information on the whereabouts of this item is asked to contact J Magraw, R1, Ext 288/351.

YOGA CLASS

There is now room in this beginners/improvers class, Thursday lunchtimes (12.40 - 1.20) in the R12 Conference Room, to accommodate any new members that may wish to join; so if you have been thinking about coming along, now is the time to drop a line to Mrs L Cooke, R1 - or just turn up at the class.

FILM BADGE NOTICE

It is Period 3. Colour strip - BLUE for $\beta\gamma$ films and neutron packs. Please check that you are wearing the correct dosimeters and that all old ones are returned.

Anyone needing a new blue $\beta\gamma$ holder should contact The Film Service, R2, Extension 430.

RUTHERFORD RECREATIONAL SOCIETY

All members should have received a copy of a letter from J N Rice, Acting Chairman of the Society which emphasises the grave concern of the committee over the lack of attendance at the AGM held on 29 October 1976. Only 2 members attended whereas 35 full members were necessary to constitute a quorum; result - the meeting was abandoned. As reported in the last issue, a new AGM will be held on Wednesday 9 March at 12.30 in the Lecture Theatre. Unless the membership secure proper nominations prior to the meeting, as laid down in the Rules and Regulations of the Society, and sufficient number of members attend the meeting the Society will be wound up and disbanded.

This will mean no more dances, no participation at SRC Sports Day, no football club, no Table Tennis Club, Model Club, Radio Club, Music Group etc.

Space limits this precis but at least the message is clear - 12.30, 9 March, Lecture Theatre - BE THERE.

SUGGESTIONS AWARDS

At the meeting of the Local Suggestions Awards Committee held on 18 January 1977 the following awards were approved.

Mr J O Talbot	Administration	R40	£5
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Mr L J Townsend	Administration	R59	£5
Mr C R B Gascoigne	Engineering	R9	£5
Mr R P Hogan	Engineering	R9	£10
Mr C T Swift	Engineering	R18	£5
Mr H Webb	Engineering	R9	£10
Mr N R Goddard	Nimrod	R51	£10
Mr A Hudson	Nimrod	R2	£10
Mr D J Price	Nimrod	R2	£5
Mr B J Smith	Nimrod	R8	£5
Mr E G Starr	Nimrod	R3	£5
Mr E G Starr	Nimrod	R3	£5
Mr S N Watson	Nimrod	R2	£5
Mr R J S Greenhalgh	Technology	R25	£5

LIBRARY NOTICE

The Library can arrange for the duplication of fiche, via the Print Room in Building R25.

OVERSEAS VISITS

Dr K Green to ILL Grenoble, 6-9 March to work on experiment.
Messrs G H Rees & M R Harold, to the USA, 6-18 March, to visit ANL, FNAL, Los Alamos, Princeton and attend the US National Accelerator Conference at Chicago.
Dr J B Forsyth, to ILL, 7-24 March, to carry out approved experiments.
Messrs D A Gray, H Hadley & B F Colyer, to Noordwijk, Netherlands, 9-10 March, to attend discussion on ESA Space Cryogenics Technology Programme.
Dr K Konishi, to Flaine and CERN, 12-21 March, to attend Flaine Meeting on Hadron Physics and to visit CERN Theory Group.
Dr L C W Hobbis, to ILL, 16-18 March to attend Scientific Council Meeting and hold discussions.

Laithwaite Confuses & Amuses

Eric Laithwaite left his mark at the Rutherford Laboratory - it's there on the stage of the Lecture Theatre for all to see! His display (for you couldn't call it a talk or a lecture) was like some giant firecracker - continually fizzing and then jumping off in the most unexpected directions. He had a large part of his audience baffled from the outset. A hurried 'demolition' of classical ideas of motion in a circle had the more numerate members of the audience reaching for their own pencils and paper, but they only had time to scribble the first few lines of their counterarguments before the display had whizzed off in a new direction as Laithwaite toyed with the superb array of equipment ranged round him like some demonic conjuror's outfit.

With a sense of humour worthy of its own TV half-hour series and with timing techniques borrowed straight from cabaret, he entertained, enthralled and mystified his audience as he orchestrated his conjuring kit with skill born of complete self-confidence. Here was Tommy Cooper, Houdini and Michael Faraday all at work.

Scientists trying to follow his arguments were beaten by the speed of his delivery, but everyone else was with him all the time - the man's sleight-of-hand with both scientific argument and manipulation of apparatus blurred the boundaries of fact and conjecture.

The display is a circus act and Laithwaite is quick to detect differences in his audience ('there can't be any electrical engineers here', he remarked as one quick aside went unnoticed). But the act is continuously being tuned to the limit as he experiments with new equipment - not always successfully!

With profound trust in his own ability and with an equally profound distrust of any 'knowledge' acquired parrot-fashion from text books, Laithwaite tries to make scientists step aside for a while from their comfortable armour of accrued knowledge and get a glimpse of what could happen when somebody comes along and starts asking all the 'wrong' questions.

There's no doubt that real advances in science occur when unconventional people come along and start asking the wrong questions, but the difficult thing is to know the right wrong questions to ask. Laithwaite doesn't know the right wrong questions, but that doesn't stop him asking.

Above all, Laithwaite's carnival showed that science can be both interesting and entertaining, and need not be subjected to the usual dry-as-dust treatment. But apart from being a master showman, Laithwaite has one big advantage. He works with big pieces of equipment and easily-grasped classical concepts. One wonders what a nuclear Laithwaite would have to do to stimulate the next generation of particle physicists.

Stay there! Professor Laithwaite defies gravity with one of his vast collection of gyroscopes.

SOUTHERN REGION CIVIL SERVICE SPORTS COUNCIL — 1977 Badminton Competition - Mens, Ladies & Mixed Doubles, to be held at the Sports Centre Basingstoke on Sunday 3 April 1977. Closing date for entries - 19 March.

1977 Singles Match Play Golf Competition, open to Men & Women. Closing date for entries - 22 March.
For further details of above events, contact Peter Craske, Ext. 232.

CHESS TOURNAMENT RESULT — As forecast in Bulletin No. 4, Peter Craske has successfully defended his chess title being undefeated for the second year running. Peter finished with 8½ points out of a possible 9 having dropped ½ point in his final game against Jim Riddle. Jim, having held Peter to a draw finished second with 7½ points, closely followed by Peter Hemmings - 7 points, Bob Maybury with 6 and Roy Culliford, fifth with 5 points.

We understand it was an excellent tournament with some very good games of chess. Congratulations to Peter on his second success.

SALES TO EMPLOYEES — Sales of scrap metal/plastics as set out in RLN 12/73 will be made on 11th and 25th March, and 1st April.

CHRISTIAN FELLOWSHIP — Dr Brian Meardon from NBRU leads our four Friday meetings in March. The meetings on 11 & 18 March are dedicated to getting a corporate understanding of the Apostle Paul's words in Colossians Chapter 2 Verses 11-15. On the last Friday, 25 March, we hope to have again a fellowship meeting under the title 'What News?'.

CHESS NEWS — Anyone interested in playing chess at the Lab or in the evenings for one of the local teams is asked to contact Peter Craske, Ext. 232.

WHEN IRISH EYES WERE SMILING — It is with great pleasure that we offer our best wishes to Eithne who was married on Saturday 19 February. For many years her unfailing courtesy and smiling face has warmed the heart of many a customer at the coffee bar in R22 and more recently in R1.

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