RUTHERFORD

Bulletin 7

4 - 25 April 1977

The American Scene - March '77

In this report Mike Harold and Grahame Rees review some of the current work being carried out at several major laboratories in the States; they also report briefly on the National Accelerator Conference held at Chicago.

Their recent visit, neatly sandwiched in between two Rugby Internationals (rather too neatly as one of them - guess who - only just made it from Cardiff in time) provided much information which will be of use in the design of the proposed SNS.

One understands that they also conferred (their words) with the elder statesman of the accelerator world who was seen later to be making copious notes on the fusion scene at the Chicago Conference; we await the next issue of the CERN Courier with considerable interest!

The Editor wishes to thank Mike and Grahame for their very informative and interesting report.

A twelve day stay in the U.S. involved visits to ANL, FNAL, Los Alamos, Princeton and the National Accelerator Conference at Chicago. We found that Argonne still have their herd of white deer, Fermi Lab their buffalo and that people continue to write their conference papers as late as possible.

The visit to ANL was to see the progress on the new 500 MeV, 30 Hz proton synchrotron and to hear of the future plans for an intense pulsed spallation neutron source (IPNS). The 500 MeV machine will serve as a new injector for the ZGS and also as a pulsed source of spallation neutrons. The synchrotron magnets are now installed and the machine will be commissioned in the near future. There is H^- charge exchange injection, using a stationary stripping foil and an adjustable closed orbit bump to remove the circulating beam from the foil (as is proposed for our SNS project). The initial spallation target will be of tungsten with an incident proton beam of 10^{12} protons per pulse, while a later development stage will use a U^{238} target with an increased proton intensity of a factor of five. The IPNS project is very similar to the SNS but uses a higher injection energy (100 MeV) and predicts twice the output neutron yield. Approval is being sought for a scheduled completion in 1983.

At FNAL we talked principally about their operational experience with the 8 GeV, 15 Hz booster. This synchrotron uses integrally potted magnets with no separate vacuum chambers (which is one of the systems under consideration for the SNS). Their operational experience of this system is good, but warned us of the activity levels in the magnets in the vicinity of the extraction straight. The booster plans to try H^- injection later in the year and they have under development a magnetron type ion source which is now producing reliably 100 μs, 50 mA H^- beams. One point of interest in the operation of the booster is the unexplained fact that only about half of the radial aperture of the magnets is of use for accelerating beam. Elsewhere at FNAL we heard of the demise of POPEYE, the ambitious storage ring proposal. The possibility of colliding proton and anti-proton beams in the FNAL main ring is still under consideration, as it is at the CERN SPS.

High Flyers

The journey from Albuquerque airport to Los Alamos was made in a maverick Maverick which had to struggle to reach the 7000 ft elevation. At the laboratory we saw the WNR neutron target station which employs an 8 kw tungsten target and will shortly come into operation with approximately 8μA maximum of the LAMPF beam. The input beam is bent vertically down to strike the target which is within a 13 ft shield wall constructed of laminated iron and concrete. The 8 kw target will be used for neutron spectroscopy, and a lower power target for fast neutron experiments and for U^{233} breeder studies. The WNR storage ring has not received approval this year but hopes to by next year. Its purpose is to modify the pulse and intensity structure of the LAMPF beam for weapons-related measurements using pulsed neutrons. The H^- ion source development at LAMPF is concentrated on a Penning type source, which has so far produced 700 μs, 50 mA H^- beams at a 10 Hz repetition rate. Elsewhere at the laboratory we saw work commencing on the PIGMI type linac structures. The low energy end of these proton linacs use alternate phase focusing and an operating frequency of 450 MHz. The high energy end operates at 1350 MHz and with 5 MeV/m accelerating fields in a new design of cavity coupled structure.

There were no guards at the gates at ANL, FNAL or LASL during daylight hours. This financial stringency was not evident at Princeton where the TFTR project is now well under way (the U.S. equivalent of the JET project). The building costs for this project approach $50M, and this year's budget $80M. At present the staff are housed in the original PPA accelerator building. The ion source development work for the neutral beam injection is being undertaken at Berkeley/Livermore. It was of interest to talk to Paul Reardon who has been involved in the magnet and vacuum designs for two fast cycling synchrotrons, the PPA and the FNAL booster, the first with a ceramic vacuum chamber and the second with an integrally potted magnet system. It is the choice between these that is proving one of the main design features for our SNS.

And Now For The Conference

The National Accelerator Conference followed the format of the 1975 conference with a large number of poster sessions. We favour this scheme for it is much easier to obtain detailed information at the poster sessions than at the presented talks. Most of the talks are of 10 minute duration only. There was one evening session, a panel discussion on the use of accelerators for fusion. Three of the panel members discussed the recent development in the use of heavy ions for pellet fusion; Ron Martin (ANL) discussed their proposed R&D on Xenon ion sources, a 2-4 MeV preinjector and heavy-ion linac design; Dennis Keefe (LBL) described the use of a linear induction accelerator for acceleration of heavy ions; Al Maschke (BNL) reported on experiments at the AGS where high transverse space charge levels have been achieved by means of longitudinal compression of bunches - this is of interest to reduce the number of ion beams directed at the fusion pellet. All three laboratories have received R&D funding for their programs which indicates the current interest in the work.

The conference spanned St Patricks Day and a wide range of accelerator topics. There were reports on electron cooling from Novosibirsk, status reports on PETRA and PEP, initial operational experience of the SPS and DCI and many papers on beam dynamics and engineering aspects. Most of the topics of direct interest to ourselves have been covered in the earlier paragraphs. Finally the authors wish to report their withdrawal symptoms experienced after the removal from their diet of the Chicago-style sirloin steaks.

INTERNAL EVENTS

HEP SEMINAR
Wednesday 13 April
11.00
R61 Conference Room

The Upper End of the Cosmic Ray Charge Spectrum - Are there Superheavy Elements, Monopoles or even Antinuclei in Cosmic Rays?

Professor P Fowler/Bristol University

NIMROD LECTURE SERIES
Monday 18 April
11.30
Lecture Theatre

Title to be announced. (See 'Today' notice boards).

H Fritzsch/Cal/Tech - CERN

HEP SEMINAR
Wednesday 20 April
11.00
R61 Conference Room

Duality and Baryons

B Webber/Cavendish Lab

RUTHERFORD LABORATORY LECTURE
Thursday 21 April
1515
Lecture Theatre

The Research Councils and the Concept of Usefulness

Sir Alec Merrison, DL, FRS/Vice Chancellor, University of Bristol

NIMROD LECTURE SERIES
Monday 25 April
1130
Lecture Theatre

Physics in the 30" FNAL Hybrid Spectrometer

R Planc/Rutgers - CERN

EXTERNAL EVENTS

THEORETICAL PHYSICS SEMINAR
Friday 15 April
1415
Conf. Rm., Bldg. 8.9 AERE

(e - 2e), the Atomic Analogue of Nuclear Knock-out Reactions

Professor I E McCarthy/Flinders Univ. of S. Australia.

THEORETICAL PHYSICS SEMINAR
Friday 22 April
1415
Conf. Rm., Bldg. 8.9 AERE

Introduction to Laser-Atom Reactions. - *Dr A M Lane/T.P.*

This talk will provide an introduction to the subject, to be followed up in May by Dr Peter Knight who will describe recent developments.

RUTHERFORD LABORATORY LECTURE

Sir Alec Merrison, DL, FRS, Vice Chancellor University of Bristol will be speaking in the next lecture in this series, to be held on Thursday 21 April at 15.15 in the Lecture Theatre.

Sir Alec was educated at Enfield Grammar School; King's College, London, BSc (London) and obtained his Ph. D. at Liverpool 1957. Following research in radio wave propagation he worked at AERE Harwell 1946-51 in reactor and nuclear physics research. Later he was to spend three years at CERN, returning to Liverpool and the Chair of Professor of Experimental Physics, 1960-69. In 1962 he was appointed as the first Director of the Daresbury Nuclear Physics Laboratory leaving in 1969 to take up his present post as Vice-Chancellor University of Bristol. Sir Alec was elected as a Fellow of the Royal Society in 1969 and was Knighted last year.

He will be talking on "The Research Councils and the Concept of Usefulness, and he has kindly supplied the following summary:-

'The original concept of a Research Council and its independence of Government has changed very much, particularly in recent years. The Government now looks directly to the Research Councils for the provision of useful research and this idea of usefulness and how much the Research Councils can contribute to it will be discussed.'

BLOOD DONORS THANKED

Mrs Irvine, R12 Admin has now received a letter from Mrs Beryl Phipps, the Regional Donor Organiser, expressing thanks for the response to the visit of the clinic on 14 and 15 March last. In spite of the loss of a number of regular donors due to premature retirements, 211 volunteers attended. This total included 34 valuable new donors.

Many comments have been received about the article in Bulletin 5; the information published was at that time up-dated to within a few days of publication and the Editor wishes to acknowledge the great assistance received from members of the Oxford Regional Transfusion Service in the production of the article. Since then further information has been received regarding people who were precluded from donating blood owing to having had jaundice. A method of adequate and reliable testing means that such people are now welcomed to give blood samples resulting very frequently in a number being accepted as donors.

THANKS FOR CHEQUE

A letter from R G Twycross, MA, DM, MCCP Consultant Physician at Sir Michael Sobell House, The Churchill Hospital, Oxford expresses thanks for the receipt of a cheque for £22 for Sir Michael Sobell House from the colleagues of the late Mrs Buckel.

'Please tell them that such gifts are a tremendous encouragement to those of us who are developing the work of Sir Michael Sobell House at a time of severe financial restraint. As you may know the Area Health Authority has only felt able to open half of the 25 beds. This causes all sorts of difficulties when one is trying to develop a service to the community. The gift from Mrs Buckel's colleagues is, therefore, doubly welcome. It will be used to help purchase equipment for the house so that we may achieve and maintain a high standard of patient care.'

SALES TO EMPLOYEES

Sales of scrap metal/plastics as set out in RLN 12/73 will be made on 15th and 29th April 1977.

OVERSEAS VISITS

Dr R W Newport & Mr W J Tallis, to CERN 4-6 and 4-5 April respectively, to attend European Hybrid workshop and for technical discussions.
Dr D B Thomas, to Bratislava, 4-6 April, to attend meeting of International Organising Committee, 6th International Conference on Magnet Technology.
Dr B H Bracher, to Liege, Belgium, 4-7 April, to attend ACM International Computing Symposium.
Dr C J S Damerell, to the USA, 17-22 April, to visit SLAC, FNAL and BNL Laboratories.
Dr Margaret M Curtis, 16-19 April; Dr R A Rosner, Dr J T Hyman, and Mr H Hurst, 17-23 April, to Baden, Austria, to attend SEAS Spring Technical Meeting - Dr Rosner & Dr Hyman will also attend European Network Users Workshop.
Dr A J Kilvington, to Grenoble, 12-24 April, to set up Neutron Lifetime Experiment.
Dr A R Gillman, to Cracow, Poland, 18-25 April to attend meeting on drift chamber electronics.
Mr R C Hack, to Paris, 24-30 April, to attend 4th International Congress of the International Radiation Protection Association.
Dr S D Hoath, to Erice, 24 April - 1 May, to attend course.
Dr G A Ringland, to Cracow, 25-29 April, to attend Cracow/Munich Seminar and give lecture.
Dr T G Walker, to the USSR, 25 April - 13 May, to visit Leningrad Nuclear Physics Institute.

NATIONAL SAFE DRIVING AWARDS.

The Royal Society for the Prevention of Accidents, National Safe Driving Awards for 1976 have been announced. It is our pleasure to congratulate the Laboratory drivers who have received the following awards:-

H G Paterson	-	20 year Brooch
E A Smith	-	Oak Leaf Bar to 10 year Medal (14 accident free years).
A H J Hill	-	Oak Leaf Bar to 10 year Medal (13 years).
J Culley	-	Oak Leaf Bar to 10 year Medal (12 years).
D A Stock	-	10 year Medal.
M D Fitzgerald	-	First Year Diploma

MISSING EQUIPMENT

The following item of equipment has been reported missing from R55 Mechanical Workshop:-
B.O.C., Portable Electric Arc Welding Set, Type Transarc 100. Painted Red. Rutherford No. 14/6585 etched into case.
Anyone with information, please contact A Brown, R51, Ext. 6110.

BUS DEPARTURES - EASTER

There will be a joint departure of buses at 11.55 hours on Thursday 7 April, 1977. The bus positions for this outmuster are given in a notice being displayed on all Lab Notice Boards.

FILM BADGE NOTICE

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

LETTER OF THANKS

The following letter has been received:-

"I wish to thank all my colleagues who I have worked with happily since the Rutherford Lab began, and especially the ladies who set up a wonderful send-off tea party complete with present. My wife and I think that the retirement 'Election Address' from the group is much better than anything I could compose and I will submit it to the agent for use on May 5th. I do not intend to leave the district and I look forward to keeping social contact with my friends and workmates."

We are sure all old friends of Bill will join in wishing him a long and fruitful retirement; although retirement is hardly the right word in Bill's case as he will continue and increase his activities in the field of public service, to the benefit of all.

who?

HORTICULTURAL SOCIETY OUTINGS

Day trip by rail to York on 21 April. Leaving Didcot/Oxford approx. 8.30 am returning approx. 1940 from York. £5 return. About 6 hours in York to do as you wish, or a guided coach for 89p extra. Meals on train if wished. Return dinner is £3.80 (don't know how much lunch is, but I hope to be in York before Pubs shut).

A visit to the 1977 Chelsea Flower Show to be held this year in mid-May is a must for all keen gardeners. A coach will leave the Rutherford Police Lodge at 8.45 am on Thursday 19 May, stop at Windsor for about 75 minutes for coffee, leave Windsor and proceed directly to Chelsea, arriving about 1.00 pm. The coach will depart from Chelsea at 6 pm and go to Ye Hart & Garter Hotel (a Schooner Inn) at Windsor for a meal which is booked for 8 pm. Home about midnight. Cost £2.50 (incl. coach and discount on entrance). Val Goodwin, Ext. 6256 for further information and bookings for both these trips.

CHEERIO TO LES RICHARDSON

Les Richardson retired prematurely on Thursday 31 March 1977, to bring to a close the first stage of a career that spanned over forty years of public service. At the presentation in R12 Conference Room, Dave Evans spoke of the work that Les did with the National Poultry Institute before the war, his active wartime service in the Grenadier Guards, and, following a period of convalescence after the war, some service with local council bodies culminating in the last 21 years on the Harwell/Rutherford campus.

Les came to Harwell in the middle fifties and spent some 9 years at AERE before transferring to the print room at Rutherford. From the print room Les joined the Chemistry Group and spent the last seven years there, making an important contribution to the site chemical services.

In commenting on the reliability that Les had so often demonstrated over the years, Dave Evans made the observation that, travelling to and from Swindon for 21 years represented about 250,000 miles and that in itself spoke volumes about the character that Les is.

To one of the most likeable people at the Rutherford Laboratory we say; 'Les, thank you for the pleasure of working with you.'

NOTE FROM THE EDITOR

The current issue of the Bulletin covers a period of three weeks. The next issue dated 25 April will revert to the normal 2 week period. Details of internal events in particular are still not arriving on time. Please ensure that all copy is sent to Room 42, R20 BEFORE the stated deadline for any particular issue.

In Bulletin 22 1975 we extended a welcome to Gordon Fraser who had joined the Scientific Admin Group to deal with Laboratory publications and to act as press and public relations officer. Gordon has now left us to take up a post at CERN as Assistant Editor, CERN Courier. We wish him every success in his new job and hope that he does not suffer too much from withdrawal symptoms after the removal of his favourite 'brew'.

Tail Piece

A number of amusing items appear from time to time on the Editorial desk, the following being the latest to arrive:-

Grope Therapy - a form of massage.
Grope Theory - for solving two-body problems.

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