RUTHERFORD

Bulletin

17

12 September - 3 October 1977

Petrafied!

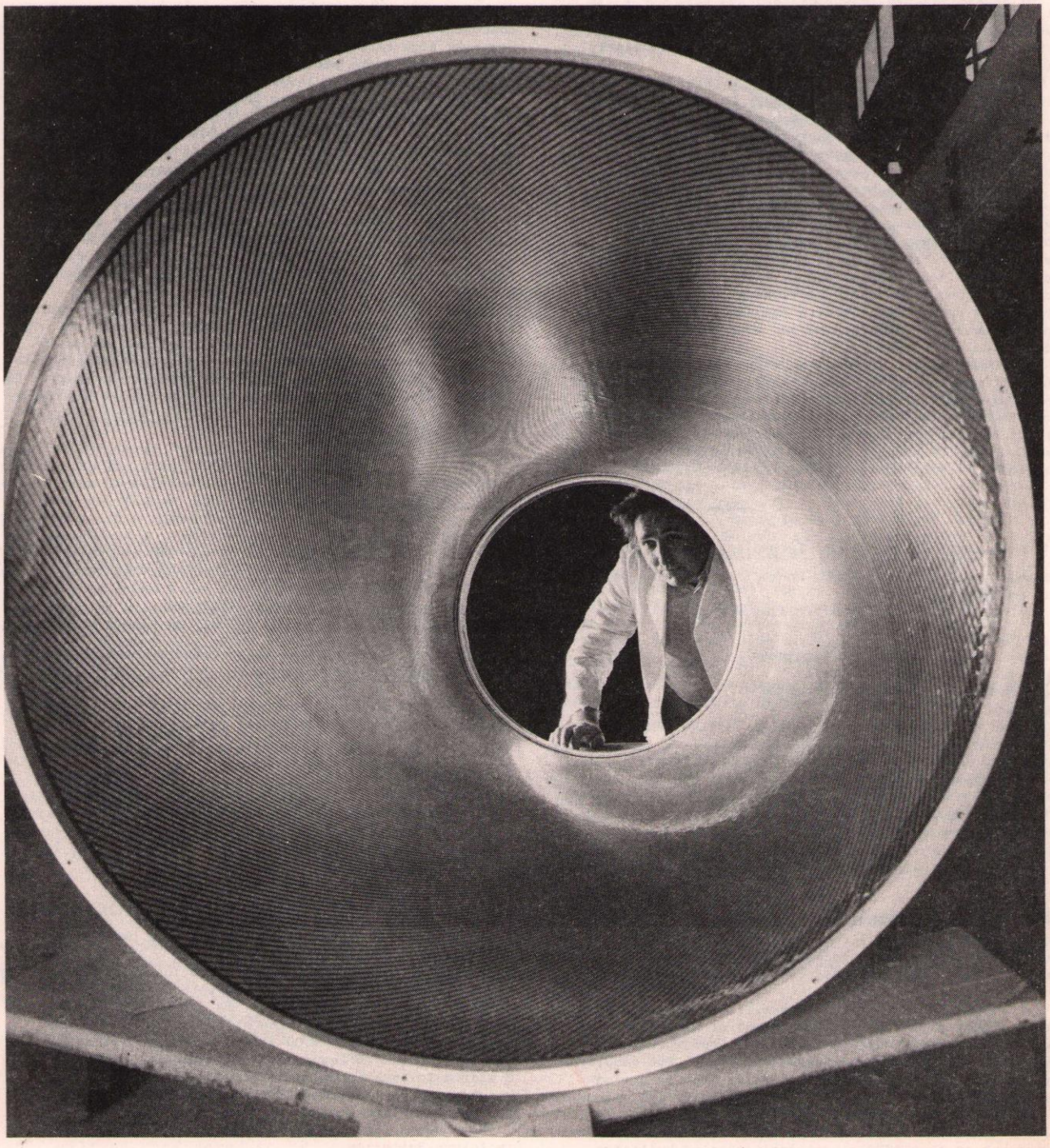


Photo: Reg Jones. Story: bottom of page 2.

They Came Back From The Cold

The Xth International Conference on High Energy Acceleration was held from 11-16 July in the 'Palace of Culture', Protvino, Moscow Region. Protvino, situated in a pine forest close to the Protva River, is the home of the IHPE Serpukhov Laboratory, the very old town of Serpukhov being some 25 Km away.

The following report was kindly produced by Charles Planner and Ian Gardner who attended the conference followed by a tour of the Institute of Nuclear Physics at Novosibirsk.

Due to visa problems we journeyed to the conference via the Russian Embassy in London and arrived in time for the beginning of the second day. The organisation of the Conference and the hospitality were very good but somewhat shadowed by the death in the preceding week of G Budker and by expressed concern for the fate of Yuri Orlov. The French delegation were particularly active in expressing such concern.

The Conference opened with a paper by Prof Arbuzov reviewing the Problems of High Energy Physics followed by status reports on existing machines, future machines and proposals. J B Adams observed that there appeared to be a new invariant of accelerators, for all the machines, regardless of size and complexity, appeared to take five years to build. TeV accelerators should soon be a reality with the 1 TeV NAL energy doubler/saver and the Russian 2.5 TeV proposal for Serpukhov. The conference then moved on to the nitty gritty of the physics and technology of beam production, handling, acceleration, injection, storage, extraction, control etc. and wound up with the development of accelerators for medical application in both the USA and Russia and application of accelerators to ion beam fusion and nuclear fuel breeding.

There were lighter moments such as the conference dinner. Vodka drunk the Russian way proved to be a very rewarding experience once mastered but required much practising and many demonstrations to obtain perfection. The conference was followed by a tour of the Institute of Nuclear Physics at Novosibirsk. The Institute is situated in Siberia in very pleasant surroundings close to the lake formed by the dammed river Obbe and houses a confusing assortment of accelerators and storage rings - VEPP 1 (now a monument), 2, 2M, 3 and 4 and NAPM plus others without name or number. The laboratory was very open and we were shown a demonstration of electron beam cooling of a proton beam in NAPM. VEPP 4 was being prepared for electronic position colliding beam experiments at 7 GeV, an energy between the existing SPEAR and DORIS machines and the PEP and PETRA machines now under construction; the aim was to start experiments about the middle of next year. Electrons have already been transferred from VEPP 3 and stored at 1-5 GeV but more rf systems have to be installed before they can be accelerated to full energy; the positron injection system is almost complete. A great deal of interest was generated, both at the conference and at the Lab, in the Gyrocon which is a new very high efficiency rf generator developed at the Institute. We were shown the system being developed for VEPP 4 which was a large device about 5M high and 3M diameter designed to give 5MW cw of rf power at 181 MHz with an efficiency of $\sim$ 90%. So far it has delivered just under 1MW at about 80% efficiency. There was also a pulsed version operating at 430 MHz and delivering a 40MW 10 μsec pulse every second.

The Institute has two very large workshops and is probably unique in the Soviet Union in manufacturing everything in house. Approximately half their budget (annual budget $\sim$ 20 x 10^6 roubles) is derived from the sale of accelerators for industrial applications. They have even exported to West Germany and the USA. People working at the Institute get 30% extra salary for working in Siberia (perhaps somewhat analogous to getting London weighting for working at Swindon Office). We were assured that although the temperature reached 40 below zero in winter it was really quite pleasant as there was no wind. We were not convinced and thanked them for their excellent hospitality and left for Moscow and home.

We are pleased to report that our GWGI survival kits were not necessary.

TRAINING Reading College of Technology - Short Courses

Information has been received about the following one-term evening courses.

Further information from Training Section.

Basic Electronics
Electronics for Mechanical Engineers
Applications of Semiconductors
Applications of Integrated Circuits
Logic and Switching Circuits
Introduction to Analogue and Digital Interfacing
Introduction to Microprocessors
Introduction to Microprocessors, Practical Course
Colour Television Theory
Colour Television Practical Course
Production Planning and Control
Welding Technology

MISSING EQUIPMENT The following items of equipment have been reported missing from Room G3, Building R2:

Avometer Model 8, Ser No 1159-C-3630 D
Tektronix Plug-in Unit, Type 80, Ser No 000779.

Anyone with information on the present whereabouts of these items is asked to contact J E Ellis, R2, Ext 6689.

The following items of equipment may have been returned to the wrong location following repair:

Engraving Machine, AERE No 7947 - information to Mr G Soulby, Building R35

Miners Cap Type Safety Lamp, Ser No 219 - information to Dr I S K Gardner, Building R2, Ext 6109.

'Petrafied' continued

The photograph on page 1 shows the outer shell of a prototype cylindrical proportional chamber for the Two Arm Spectrometer Solenoid (TASSO) experiment on the new PETRA facility at DESY.

The shell (yes - it is a cylinder), diameter 0.572 m, active length of 1.4 m, is constructed of laminated foamed polystyrene and supports the cathode which is formed from 239 copper strips on a kapton backing. The completed chamber, built by the Physics Apparatus Grap is now on test in R36.

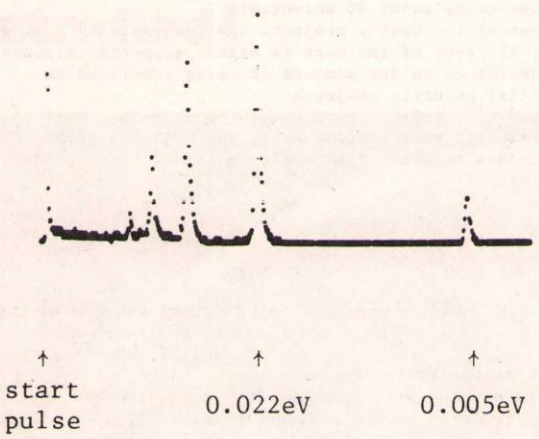
This single gap chamber, a prototype of a 4 gap cylindrical chamber, part of the Rutherford Laboratory's commitment to the TASSO experiment, is being built for Imperial College, a member of the collaboration involved. It is expected that the 4 gap chamber will be delivered to DESY by August 1978.

The other part of the UK collaboration, which incidently is approximately 20% of the large international collaboration for the TASSO experiment, is the Nuclear Physics Dept, Oxford University. The RL's commitment for the Dept consists of over 4000 single wire proportional chambers up to 8 m long; nearly 100 scintillators; 2 hadron filters approximately 6.4 m high by 8 m long weighing nearly 350 tons each and over 300 tons of steel for the magnet yoke.

We hope to report more fully on the RL's commitment in future Bulletins.

Spallation Neutrons from Nimrod

During the summer break in the HEP programmes, Nimrod has been used for a series of thermal neutron experiments related to the SNS project. The preliminary report below is based on information supplied by George Stirling of the Neutron Beam Research Unit (NBRU).



The result, shown opposite, was obtained at the first try on Tuesday 23 August, and shows the diffraction pattern of thermal neutrons scattered from the atomic planes in a large single crystal of germanium. Running time was only a couple of hours. This experiment, probably Europe's first spallation based neutron diffraction spectrum, was part of a series designed to test various parameters of importance in the spallation production of neutrons. To this end Nimrod has had to learn an entirely new set of tricks in its old age - and has done so surprisingly well. First the proton energy was dropped to the range specified for the SNS, 0.7 to 0.9 GeV, rather than the more familiar 7 GeV. In addition, installation of a fast kicker magnet in the extracted beam has enabled short pulses, $\sim$ 5 μs, to be landed in the target area. Proton intensities, although around 100000 times less than those available on the SNS, have been quite adequate for the present purposes.

Experiments have included a series of measurements of thermal neutron yields, spectra, and pulse shapes, for different targets (uranium, lead), moderators (water, polyethylene) and reflectors (beryllium, graphite), in different combinations and geometries. A full set of data has been obtained and the results will be valuable in optimising the final SNS design; detailed analysis is underway and a full report will be issued later. The whole exercise has been a fruitful collaboration between the NBRU, and the Nimrod and Instrumentation Divisions.

TRADE EXHIBITION
20 and 21 SEPTEMBER
1000-1630
R12 CONFERENCE ROOM

REGMA(UK) Ltd are presenting a two-day exhibition and demonstration of products from three of their Divisions. In addition to examples of the standard range of equipment, many new items will be shown including their A 130 dry plan printer - the first of a new line; three advanced films which do not fade or stain including the very new, opaque, sepia-line weather and friction proof film and a competitively priced drafting stand.

Office copying is covered by the 1600E electrostatic roll fed machine and the EG 101 plain paper copier, a new machine with unusual features.

Microfilm/fiche readers/printers - a wide range including the unique LR 6 with fiche, roll film and 3M cartridge attachments, 13 interchangeable magnification ratios, 6 standard copy sizes and multi copy selector, (1-20).

Specialist staff from the firm will be in attendance.

INDUSTRIAL TRANSPORT CHANGE

The present contract for the industrial home to work transport, Highclere/Penwood area, will not be renewed in December 1977.

The area includes Highclere, Burghclere, Penwood, Newbury Newtown and intermediate hamlets; the most southerly pick-up will then be "The Gun", Wash Common.

ANY OLD IRON?

As August, the peak holiday month has now passed, many readers may have missed an important announcement; in other cases the sheet of paper containing the announcement may have accidently fallen into the waste paper basket before the recipient had found time to read it!

The announcement was issued on RL Circular No 17/77 and contained the following short statement:-

Renovation work on the Fermi Avenue Runway will shortly commence as part of the preparations for the SNS project.

Any material not cleared from the runway area between R56 and R34 by Monday 12 September 1977 will be considered to be waste and subsequently removed from the site.

RUTHERFORD LABORATORY LECTURE

The 1977-78 season opens with a lecture by Professor P J Lindop, MB, PhD, DSc, MRCP from the Department of Radiobiology, The Medical College of St Bartholomew's Hospital. Patricia Lindop was educated at Malvern Girl's College and St Bart's Hospital, Medical College and has won a number of awards and held many appointments during her career; so many that her entry in 'Who's Who' lists Recreation as 'still looking for time'. Among others, at present she is a Member of Council, Science and Learning; Member of Council, British Institute of Radiology and Member of the Royal Commission on Environmental Polution.

Her lecture entitled "Cancer Treatment - Can High Energy Physicists Help?" will be given in the Lecture Theatre on Thursday 29 September commencing at 15.15.

Prof Lindop, who is no stranger to the RL, has kindly supplied the following summary:-

"Many cancers can be controlled by treatment to improve the length and quality of the patient's life.

SOME CANNOT

Factors which limit successful treatment will be discussed. These depend on the need to localise the treatment to the cancer cells, particularly those resistant to drugs or ionising radiation.

Current studies of the use of π^- mesons and accelerated heavy ions throughout the world will be discussed in the context of the role that the Rutherford facilities have played and could play in this rapidly advancing field of study".

BULLETIN NOTICE

Owing to Laser Conference commitments this issue of the Bulletin covers a period of three weeks.

IT'S BLOOD DONOR TIME AGAIN

A National Blood Transfusion Service Unit will be visiting the Lab for the second time this year, on Monday and Tuesday, 3 and 4 October. Regular donors will have been notified of appointment times; new donors are welcomed at any time between 1000 and 1200, 1330 and 1500. People who have stayed away owing to having had jaudice can now attend the clinic.

MRC Open Days

The Medical Research Council Radiobiology Unit, one of our neighbours, has arranged two open days for visitors. The Unit will be open from 1000 to 1530 hours on Friday, 30 September and from 1000 to 1300 hours on Saturday, 1 October.

The idea is to provide an opportunity for others working on the Harwell site, as well as friends and families of the Unit Staff, to see some of the work of the Unit.

There will be approximately 25 displays in Building 383 based on work done by the five groups within the unit; pathology, cytogenetics, cell mutation, radiotoxicology and mammalian genetics. A detailed programme will be available on request after 19 September.

The Radiobiological Research Unit as it was then known, began its work at AERE Harwell in 1947 with a remit to investigate the toxic actions of radioactive substances and to develop methods of protecting workers against them.

The Unit's first Director was Dr J F Loutit who is still working at the unit as an independent member of MRC External Scientific Staff to which he was transferred when he left the Unit in October 1969.

The next Director, Dr R H Mole, retired from the position on 18 July this year to transfer to External Scientific Staff at the Unit and 'get back to the bench'; the current Director is Dr J Vennart.

The present strength of the establishment is about 140 including about 30 scientists.

Most of the Unit's projects are commissioned by the DHSS; the rest of the work is either supported already by EURATOM or in the process of being submitted as potential priority projects.

This very brief report can do no more than hint at the valuable work undertaken by the Unit, so why not take the chance to see for yourself on either the 30th or the 1st.

LUNCHTIME FILM SHOWS AT AERE AND CULHAM

Lunchtime films will be shown in the Cockcroft Hall at 12.30 certain Thursdays throughout the winter (and at Culham on each previous day). The programme is presented by the Harwell Film Society on behalf of the Education and Training Centre. Although copies of the winters programme can be obtained from - "Lunchfilms, Room G42, Bldg 424 AERE we shall be publishing details of current film shows in appropriate Bulletins.

21/22 September: "Introduction to Diffusion Bonding" (Welding Institute) - new opportunities for an old technique.
"Engineering: North Sea" (Shell) - The enormous scale of construction required to bring home the oil.

5/6 October: "Crown of Glass" (Shell). The largest commissioning of stained glass in history.
"Meetings: Bloody Meetings" (Video Arts) John Cleese shows you how not to hold them.

The Harwell Film Society has arranged an attractive evening programme starting on 27/28 September with "Don't look now", starring Julie Christie and Donald Sutherland. Details of the season's films and membership can be obtained from Joan Homer, Library, R61, Ext 6163.

CHESS TOURNAMENT

The Lab's longest running tournament now in its tenth year will be starting shortly. This year's event will be either an all-play-all or Swiss tournament. Please contact P Craske Ext 232 for details. Names to be in by 30 September.

REC SOC DANCE

Friday 7 October in the Restaurant. Dancing from 8 till 1 to 'Nitelife'. Usual supper. Tickets - £1.50 each from Val Goodwin - R1, P Craske - R2, D Evans - R34. Book early. Tickets limited.

HORTICULTURAL SOCIETY PARTY

An informal evening has been planned to launch the Horticultural Society into their Autumn/Winter Season.

The evening will take the form of a WINE AND CHEESE PARTY (catered by Wells Stores of Streatley), so there will be a very fine selection of English cheeses (with french bread and butter) and a red and white wine (Red Charbonnier and White Imperial Coquillages - a medium Loive wine).

Admission by ticket, only, (£1.50 per person) from Val Goodwin Ext 6257 or Wendy Dance Hangar 7 AERE Ext 2312.

All new members joining for the 1978 season will be given two free raffle tickets (the annual subscription is still only 25p) and this offer will also apply to existing members who pay their dues at this time for the coming year.

The party will be held in the R22 Coffee Lounge on Friday 14 October commencing at 8.15 pm and applications for tickets close on Friday 30 September 1977.

OBITUARIES

We deeply regret to announce the death of Mr G J Hackett in a car accident on Tuesday 30 August. He was aged 60. Geoff Hackett joined Harwell in 1954 as a craftsman and moved to the Rutherford Laboratory as a Technician in charge of the R2 electrical workshop in 1961 rising through promotion to a PT02. A man of great understanding and ability, he earned the respect of his superiors and in particular, his own workshop staff; he will be sadly missed.

Geoff's wife who was severely injured in the accident was taken to the Battle Hospital, Reading, where she has been in an intensive care unit. The latest news is that she is now making good progress and we hope that she will continue to so do.

Our deepest sympathy is extended to her and the family.

We also deeply regret to announce the death of Mr K Swindells on Thursday 18 August. He was aged 51. Ken Swindell, an EWIV joined the Lab nine years ago and at the time of his death was a member of the Physics Apparatus Group. We extend our deepest sympathy to his sisters.

RUTHERFORD LABORATORY BULLETIN . *Published by the Scientific Administration Group*

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