

Bulletin

of the Rutherford and Appleton Laboratories 22 Sept. 1980 No.13

Setting the Pattern for the Future

Down in the Magnet Hall at dawn on the morning of Wednesday 17 September the atmosphere was tense with a mixture of excitement and anxiety. At 6.30 hrs the first of a fleet of mixers, that would arrive at ten minute intervals, would begin the continuous pour of concrete that would fill the old Nimrod service trench, the first stage in construction of the foundations for the SNS magnet ring.

For weeks staff & contractors had been hard at work in preparation for the fill. A re-inforcing mesh of 34 tonnes of high yield steel had been built into the trench, and the outer walls faced with synthaproof to insure adhesion of the plug to the internal face only, so that the addition forms a solid extension to the central monolith. Because the SNS has 10 sections instead of the 8 sectors of Nimrod and a larger circumference, 10 special corbels

had to be constructed on the outer edge of the trench to provide an extended base for the 10 dipole magnet supports. The pour would go on until 1400 hrs, during which time 384 cubic metres of concrete would be laid, in four layers - each of the first 3 layers 475 mms thick with a final 150 mm topping layer. Placing of each layer was to be timed so that vibrating pokers could penetrate the previous layer, ensuring maximum compaction of the concrete.

The headlights of the first mixer suddenly appeared in the entrance of Hall 2 and a frenzied activity began. In the midst of this organised chaos David A Grey (Division Head SNS) stepped gracefully into two trays of the mix and had his footprints registered for posterity. Nothing was said - the noise was deafening. Another step in the construction of the SNS was underway.

Progress & Future Plans

The Spallation Neutron Source, designed as the world's most powerful source of pulsed neutrons, will provide a unique facility for British scientists in many disciplines who use neutrons for their research. New equipment is now arriving which will be used for the facility, together with equipment from Nimrod and Nina.

Future finance for the programme has been made more secure with the SRC approving about £7.2M a year at current prices in its Forward Look during the five years from 1981/82 onwards. This has enabled firmer planning to be made for the SNS programme.

Provided that arrangements can be made to cover requirements in the current financial year, it is expected that a series of milestone dates, can be achieved.

Early 1982.

Injector complete. 70 MeV H^- beam.

Early 1983

Magnet ring and vacuum complete.
Injection line and injection system complete.

Some machine diagnostics installed.
Injection tests.

Mid-1983

2 RF stations installed (out of 6)
Main magnet power supply working.
Acceleration studies at low intensity.

Late 1983

4 RF stations installed.
Extraction system installed.
Extraction studies at low intensity.

Early 1984

With 4 RF stations.
Extracted proton beam installed.
Target station installed.
600 MeV protons (low intensity)
producing neutrons in the target.

Late 1984

6 RF stations installed.
800 MeV protons (low intensity).

~ 1986

Full intensity operation with 800 MeV protons.

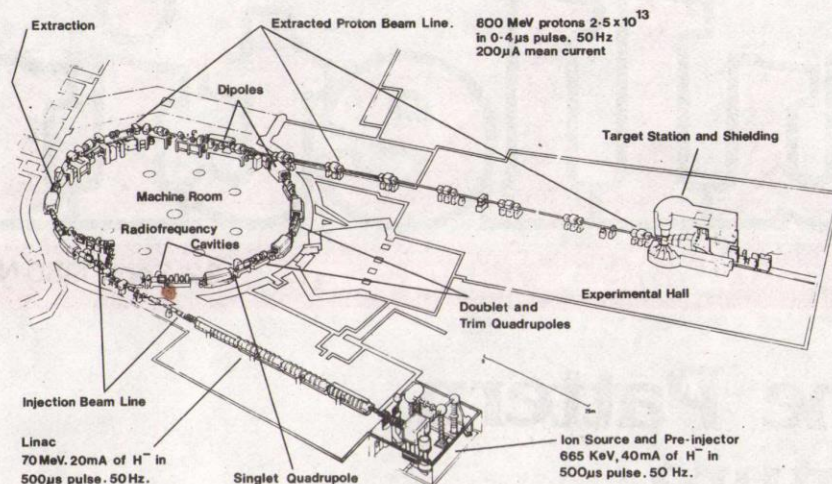


Best feet forward.

33567.

The computer control system for the facility has to meet the developing requirement. Low intensity operation will be necessary initially to learn about the machine and to ensure that any beam lost is deposited in the specially placed lost beam collectors around the machine. In this way induced activity is located where it can be dealt with by remote means. It is intended to operate the machine such that induced activity in other components is low enough to allow hands-on maintenance.

Approval has been received for 7 of the 25 or so instruments which will eventually use the neutrons coming from the 18 beam holes. With the money rate as available it is expected that 5 instruments will be available in 1984/85, with a total of 11 in 1985/86 and 15 in 1986/87. These could be brought forward if other countries agree to participate.



The Spallation Neutron Source

SPALLATION NEUTRON SOURCE

32920. — added notation — D.A.G.

Equipment

The SNS design parameters have been fixed and individual components are in various forms of detailed design, development, manufacture and delivery. The Nimrod magnet room has been completely cleared and the equipment in the experimental halls dismantled and disposed of if not required. Civil engineering modifications have been specified and ordered, notably work in the machine room to provide the magnet foundation. Electrical and mechanical services have been specified and ordered including a new 40 ton crane for the machine room.

The 70 MeV injector, built for but not used on Nimrod, is being modified to produce 20 mA of H^+ ions at 50 Hz. A prototype ion source has been built and is in the process of being commissioned. The pre-injector is being modified to accept the new ion source and with opposite polarity. The linac radio-frequency cavities are being modified for the increased mean power rating. Four new modulators for powering the RF valves are being built in the Laboratory. The diagnostic equipment, important because of the mean power of 35 kW in the beam, has been redesigned and is being made.

Detailed design of the beam line between the injector and the machine is in hand. In general, existing components will be used. A new DC septum magnet has been designed and the injection kicker magnets which steer the beam into the machine are about to be ordered. A contract has been placed for the development of the foils which strip 2 electrons from each H^+ ion to produce a proton. This is necessary in order to produce the required intensity of protons in the machine with the correct dynamic characteristics.

The Ring

The magnet system has been ordered, the 20 doublet quadrupoles (see plan) have all been delivered and are being fitted with alignment targets.

Almost all the 20 trim quadrupoles have arrived. These enable the total focussing field in the system to be controlled continuously throughout the 10 millisecond magnet rise time. The 10 main 4.5m long dipole bending magnets, each weighing about 40 tons, have been ordered and the prototype is expected at the end of the year. Each dipole has a field gradient providing some horizontal focussing. Vertical focussing is provided in this part of the lattice by a singlet quadrupole, 10 of which have been ordered, with the prototype to come at the end of the year.

Vacuum chambers in the magnets must be non-metallic and a unique ceramic chamber system has been developed in the Laboratory. Sections of ceramic chamber about 30 cm long are delivered from the manufacturers with a glass coating on the ends to be joined. The sections are assembled and heated to 1100°C in ovens at the Laboratory. The glass forms joints which tests have shown to be strong enough for the standard joints and for joining on ceramic flanges. All the ceramic chambers have been ordered. The assembled and glued prototype singlet quadrupole chamber has been tested successfully. The prototype dipole chamber, which is 4.5m long with a 36° bend, is partially assembled and glued.

Inside the vacuum chambers there will be a structure around the beam with specific radiofrequency properties. This is to ensure that the two circulating bunches of protons do not induce voltages on the surroundings, such as the magnets, which would then induce large oscillations in the proton bunches and lead to a loss of protons. The shields are currently in the stage of detailed design.

The 50 Hz magnet ring power supply is based on NINA components. The large choke for this has been placed in position by Hall 3. The bias power supply is on order and will be delivered shortly.

RF System

The RF frequency system is relatively large bearing in mind the energy of the machine. This is brought about by the rapid acceleration rate (10 ms rise time) and the high current of protons. The RF frequency changes from 1.3 MHz to 3.1 MHz as the protons speed up, and the cavities are kept on tune using biased ferrite rings. Some 400 rings of ferrite, weighing in all about 7 tonnes, will be used. About three-quarters have been delivered and are being tested to determine their exact position in the accelerating cavities. Discs, made from soldered-up copper tube and then machined, will cool the ferrite and are being delivered. The prototype cubicle for the main RF valves is being made in the Laboratory. A prototype anode power supply has been delivered and preparations are under way to manufacture the required 6 supplies in the Laboratory. Supplies for biasing the ferrite will be ordered shortly. The low and intermediate power RF system is under design and development. A complete prototype RF system is expected to be ready for testing at the end of the year. Hall 2 will be filled with power supplies for the RF when these are completed and installed.

The diagnostic equipment for measuring intensity, position, profile and loss of the beam is being designed, developed and manufactured.

Extraction

Requirements that the neutron pulse length from the SNS target should be only a few microseconds mean that the protons must be extracted from the machine within a single turn (0.4 μs). Three kicker magnets to deflect the protons vertically will be used and have a rise time of about 0.2 μs. A prototype kicker system is being used to test the lifetime of the thyatron switches on which no information is available.

The design for the extracted proton beam line, which takes the proton from the machine to the target, has recently been simplified. In the main, it will use existing magnets, power supplies and shielding.

The Target

The target, in which 25-30 fast neutrons (spectrum peak ~ 1 MeV) will be produced for each 800 MeV proton, consists of plates of U^{238} about 8 cm diameter clad with zircalloy. Cooling is by heavy water flowing between the plates. About 250 kW of heat is dissipated in the target. A contract has been placed for the development of the plates. Computer codes have been developed for the determination of heat loss, neutron production and neutronics in the target and moderators (which slow down the neutrons) and for the reflector. It is expected that two room-temperature moderators, with one at 70K and one at 20K, will meet the experimental requirements for neutrons.

and Station

The outline design for the target station and shielding has also been simplified and improved. The target chamber will have a helium atmosphere to reduce neutron scattering and the chamber containing the shutters for the 18 beam holes will be air-cooled. Collimators for each beam hole will be made individually within the outer shield wall. Spent targets can be withdrawn remotely into a handling cell and then to a cooling-off cell. A hole in Experimental Hall 3 has been excavated and a water-proof liner put in. A tunnel has been enlarged for the cooling-off cell and a cavern for possible neutrino physics has been made. Filling of the hole with Nimrod magnet steel and concrete is now complete. This minimises the effects of neutrons reflected from below the target and shields against activation of ground water.

Control System

For the facility overall, the control system is under development. The main computers are here. Systems software is under development and so also are the hardware and software interfaces for equipment. A new software system has been developed which will allow microcomputers controlling individual pieces of equipment to be programmed in a high level language and to interface to the main control system.

The water cooling treatment plant, ventilation equipment, transformers and switchgear available from Nimrod are being refurbished and the necessary modifications are in hand to the system for services to individual components.

Much done

It can be seen from the above that a lot of work has been done. Orders

have been placed amounting to about one-third of the value of new equipment to be obtained. As equipment comes in it has to be tested and installed, sometimes to high positional tolerances (0.1 mm). This will put large demands on the members of the SNS teams who are expecting to respond successfully to the challenge of providing the world's most powerful and best spallation neutron source.

RAL Lectures 1980/81 series

DATES FOR YOUR DIARY

Thursday October 16

Professor Harold Hopkins FRS of Reading University will speak on

"Optics in Clinical Medicine"

Many new optical techniques have been introduced in recent years and Professor Hopkins has an international reputation (not to mention valuable patents) in this field.

Wednesday November 12

Mr K E Clarke of the Post Office Research Centre at Martlesham will speak on

"National and International Developments in Viewdata Systems"

Mr Clarke is leader of the Post Office Viewdata group at Martlesham.

Thursday December 11

Professor Eric A Ash FRS of University College, London, will speak on

"Acoustic and Photoacoustic Imaging"

Professor Ash is no stranger to RAL, being actively involved in the programme of the Electron Beam Lithography Unit. Acoustic and Photoacoustic imaging seem likely to have important applications in microscopy.

Thursday January 22 (1981)

Dr Michael S Tite of the British Museum will speak on

"The Impact of Physics on Archaeology"

Dr Tite is Director of Research at the British Museum. His personal research has been primarily on thermoluminescent dating and the use of nuclear magnetic resonance magnetometers in the surveying of archaeological sites.

Thursday February 19

Dr Cyril Hilsum FRS of the Royal Signals and Radar Establishment, Malvern, will speak on

"Liquid Crystals"

The Japanese make most of the world's digital watches but due to the efforts of Dr Hilsum and his collaborators the UK holds most of the key patents on liquid crystal displays. This is a success story, recently recognised by the award to Dr Hilsum et al of Optoelectronics.

Thursday March 19

Dr John B Adams CMG, FRS, Director General of CERN, retires on January 1. He has not yet chosen a lecture title but has agreed to review and reminisce about the work of CERN. No doubt Dr Adams will have many invitations to lecture during the next year or two but we appear to have got in first.

Thursday April 30

Dr Michael Rycroft of the British Antarctic Survey will speak on

"Research in Atmospheric Sciences in Antarctica"

Dr Rycroft is head of the Atmospheric Sciences Division of BAS. He will be summering in Antarctica this winter but expects to be back in time to give his lecture.

Thursday May 28

In the last lecture of this series Professor Nicholas Kurti, CBE, FRS of Oxford University will, in his own phrase, be "letting his non-existent hair down" and tell us

"How to be a Physicist and let others enjoy it"

Professor Kurti is well known for his pioneer work in the field of low temperature physics and probably needs no introduction to RAL staff.

Film Badge Notice

It is Period 10, Colour Strip BLUE. Please check that you are wearing the correct badge and all old ones are returned.

Next Film Change Monday, 6 October.

REMINDER Those people who have not yet returned their National Registry Forms please do so as soon as possible to Mrs J A Coates R12.

Lectures

HEP SEMINARS
R61 CONFERENCE ROOM - 1100 hrs

24 September: Dr M Teper/RAL
'A confinement safe charge measure for QCD jets'

NIMROD LECTURES
R61 CONFERENCE ROOM - 1400 hrs

22 September: Dr S J Watts/QMC
'KN polarisation in the range 0.8-1.4 GeV/c'

29 September: Dr K Konishi/RAL
'Status of QCD jets'

Table Tennis

As all scientists know the study of elastic collisions can provide hours of entertainment and satisfaction. The Table Tennis Club fulfills this need, at a fraction of the cost, for all. The Club participates and is organised on two fronts: Lunchtime and Evening League table tennis.

LUNCHTIME TABLE TENNIS

The pulling down of R15 has meant that there has been no lunchtime play for the past year. However three teams were entered in the AERE lunchtime league and the 'A' team of Peter Kent, Tim Pett and John Varley were the eventual winners. The 'A' team of Arthur Chilvers, John Varley and Harry Jarvis also won the SRC Indoor Sportsday competition at the Oasis, this year.

Now that our new premises in R58 are available it is hoped to build up our lunchtime activities to the level of a year ago, restarting the ladder and handicap competitions and the general Club Tournament.

Membership is open to all full and associate members of the Recreational Society. There is a small subscription to cover the cost of bats and balls provided for general use. New members are very welcome regardless of standard.

EVENING LEAGUE TABLE TENNIS

Despite the lack of premises last years season proved fairly successful. The pre-season tournament was held at the Old Gaol, Abingdon. Twelve players took part, the winner being Tim Pett who beat Peter Horton in the final.

Three teams were registered with the Didcot & District Table Tennis Association. The 'A' team of Tim Pett, Eric Thomas and Colin Cherrill bounced straight back, after last year's relegation, to win Div. II with 40 points. The 'B' team of John Varley, Bob Hopgood, Edwin Jayne and Peter Tipper were fourth in Div. II as were the 'C' team of Brian Wyborn, Peter Collins, Harry Jarvis, Peter Horton and Richard Lawrence in Div. III.

Tim Pett won individual honours by winning the Div. II singles championship and the Club represented by John Varley, Brian Wyborn and Colin Cherrill reached the semi-finals of the Bidmead Handicap Shield.

The R12 Conference Room was used for all home matches and the Club thanks Mrs Dorothy Irvine and the Security Wardens for their cooperation.

At present we are preparing hard for next season, when 3 teams have been entered, one in each of DIVS I, II &

III of the DDTA league. With new premises and the arrival of Ditton Park personnel the future of the evening league section looks promising. The club would very much like to hear from any prospective evening league players.

For information contact John Varley, Brian Wyborn or Tim Pett.

Squash

Wednesday 27 August saw RAL's happy band of squash players (with a little much-appreciated help from two last minute substitutes from Harwell) take on the might of Challow Country Club. Teams of four men and three ladies battled it out on Harwell's courts with RAL emerging victorious from a 5-2 score-line.

Can we maintain this sparkling form in the away encounter, coming soon? You don't have to be of County standard to join in (if you are, where have you been hiding?), so any men, ladies or otherwise who know which end of a racquet to hold and wish to participate in a light hearted excuse to go down to the pub afterwards, should contact Richard Lawrence, ext. 6240. Team members v Challow were:

Bob McClure, Elwyn Baynham, Richard Lawrence, Allan Briggs, Jenny Coates, Leona Cooke and Pauline Stewart.

Crib

During the past year we have run two Dinner-time Crib Leagues and held a Finals Night.

The winners of the Winter League were Alan Grant's team. The Singles title was won by Jack Ackhurst, runner-up Peter Craske, and the Doubles was won by P Craske and R Newman. Trophies were presented to the winners by the Chairman of the Rec Soc Mr R E Thomas. The Summer League has just been completed and won by Tony Lubbock's team with 24 points. The winners will be presented with their trophies at the same time as the presentation to the Indoor and Outdoor Sports Day winners.

We are restarting a Winter League at the beginning of October. If anyone has a team of three to enter, would they please contact Tudor Morgan, R18 as soon as possible.

We have already had the pleasure of welcoming our new colleagues from Ditton Park, who entered one team in the Summer League. More are always welcome.

Chess

Last season was a quiet one for the club, the Rutherford Tournament and the SRC Individual Tournament being the only activities, no games being played against outside clubs.

As usual the Rutherford Tournament was a close affair with Peter Craske winning by $\frac{1}{2}$ point from Peter Hemmings. This tournament has now been running for twelve years.

The SRC 'Individual' was a lightning tournament played during the Indoor Sports Day at Swindon. Once again Rutherford proved successful, Tim Jones winning the title.

Angling

The Angling Club has had an eventful season with the Rutherford, SRC, Civil Service Team and Individual tournaments.

The Rutherford Championship was fished on the Thames at Clifton Hampden in good weather, which made a change! Peter Craske won the title with Daryl Taylor in second place.

A team was entered in the Civil Service Team event. After two years of fishing the River Stour, it was switched to Broadlands Lake at Romsey with disastrous results. Not only was the Rutherford team fishless, but only three of the one hundred anglers caught any fish at all.

In the 'Civil Service National' we had better luck. For the first time the SRC had two anglers amongst the prize winners; Peter Craske and George Render. This year we are hoping to do better in both Civil Service events.

At last Rutherford managed to beat Daresbury in the SRC Tournament. This annual 'needle-match' was won by the team of Tony Ferrari, Denis Day, Frank Smith and Len Wilson, just ahead of the other Laboratory team.

The Individual title was won by Peter Craske with Ernie Russell in second place.

Industrial Archaeology

Anthony Burton of the Television Series 'The Past at Work' will be speaking in Wantage on Thursday 2 October at 7.30 p.m. in Icknield School.

All practitioners of 'the white hot age of technology' are welcome to learn how things were done in the old days!

For further information contact J Banford, Ext. 484.

Bulletin

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Bulletin

of the Rutherford and Appleton Laboratories Special Issue

Recreational Society

The Recreational Society exists to promote various Recreational and Sporting facilities at the Laboratories. It also takes part in sporting activities arranged with other SRC establishments and competes in Civil Service events. New members are always welcomed to all Clubs, and a wide range of activities is catered for. Anyone wishing to start a new club or activity is encouraged to do so.

Officers

The Officers of the Society are:-

President	:	Dr G H Stafford
Chairman	:	R E Thomas
Hon.Secretary	:	P E Craske
Hon.Treasurer	:	B Wyborn
Minute Secretary:		J E Ellis

Committee

The Committee members are:-

R Brandwood	R27	Ext 6671
A Forster	R6	6300
R E Smith	R1	293
M J Hodges	R18	6638
T Morgan	R18	563
L Harding	R1	360

Member Clubs

If you wish to join any of the Clubs, please contact the people listed below:

Angling	P E Craske	Ext. 232
Chess	P E Craske	232
Cricket	M W Butler	6178
Crib	T Morgan	563
Darts	A Forster	6300
Folk Club	J E Ellis	6369
Football	R A Lowes	6328
Golf	R Bell	6137
Model Railway	R W Roberts	6280
Music	G Sandels	6373
Netball	S Underdown	443
Radio	P A Braham	6258
REMAP	P D Hey	432
Table Tennis	J Varley	6363
Slimming	Mrs J Walters	333
Yoga	Mrs L Cooke	443

Main Sports Events

There are two Sports Days per year - an Indoor Event held at Easter time - the next one in 1981 to be held at the Oasis Swindon. The Outdoor Event will be held at the Imperial College Sports Ground at Harlington in the summer. Most sports are covered by these two sports days.

venue data



Club House

Although we have moved into part of R58, we are still very restricted for space and until the site accommodation situation has eased (latest date, late 1981) we are still going to be very short of space especially for indoor clubs.

When we have the majority of R58 we will be able to expand our facilities and cater for the different clubs our Appleton colleagues will be bringing with them.

In the past the Rec Soc have arranged dances at the Laboratories. Many staff enjoyed these dances as the only gathering of the year. After the last dance in October it was decided that Rec Soc was unable to continue running dances until a suitable agreement was reached with all parties concerned. We are hoping the position will change, and dances can be resumed.

Sports Field

We are fortunate to have our own sports field located outside the site fence near the R22 Restaurant. The facilities include:

2 Football Pitches These are in use practically non-stop during the year with teams from AERE, NRPB and the Rutherford and Appleton Laboratories taking part in Cup and League competitions.

Cricket Pitch - used by the Laboratories to play in the local Downs League, and against local teams in friendly matches. We also have a team in the AERE Evening League competition.

Lecture Theatre & Restaurant

These provide excellent facilities for concerts, lectures and film shows throughout the year.

Angling

This is a busy club with a band of devoted anglers who fish the Thames at Clifton Hampden in the Rutherford Championship, enter a team in the Civil Service Event, had two prize winners in the Civil Service National this season, and beat Daresbury in the SRC Tournament this year.

Chess

The Club runs a lunch-time tournament and takes part in the SRC individual tournament held on Indoor Sportsday. New players of any standard are always welcome. See 'Bulletin' for reports.

Christian Fellowship

The Laboratories' Christian Fellowship welcomes all members of staff and visitors to join them for meetings, Bible studies, discussions and monthly prayer meetings. Twice a year films are shown in the Lecture Theatre and a regular feature of the Fellowship is the organisation of a Christmas Carol Service and an Easter Service. For further information please contact C S Biddlecome Ext. 6167.

Cricket

The Cricket Club has had a successful season - its best since it was reformed 3 years ago. Three competitions were entered - the AERE Evening League where we were losing finalists, the Berkshire Downs League where we finished in third place, and the Down League knock-out Cup where we failed to progress further than the first round. There were also several friendly games with a fair proportion of success.

There has been a continuing improvement in our facilities. We now have a practice wicket, our Square was the subject of some sterling work by the groundstaff and the Rec Soc have given admirable financial support. Next season we hope for a "pavilion" and that we can continue to show the improvement of this year.

Football

The Soccer Club continues with its established programme of competitions; the Rutherford Championship open to Rutherford and Appleton Laboratories' teams only, the Rutherford Challenge League to Rutherford and Appleton Laboratories' teams plus Harwell teams, and the Challenge Knock-out Cup also open only to R & A L teams.

Folk Club

It is hoped that two or three Folk Evenings will be arranged in the period from October 1980 to April 1981.

Golf

The Rutherford Golf Section's small six-hole course has been laid out this year but the surfaces of the greens have yet to receive their final treatment. It is hoped the course will be officially opened next Spring.

This year the Golf Section has entered teams in the following tournaments:-

1. The Bateman Catering Silver Cup Golf.
2. The annual S.R.C. Tournament.
3. The Civil Service Sports Council, Southern Region Golf Championship.

In addition the section organised a new annual knock-out competition among its own members, sixteen participated in this the Matchplay Championship.

For information contact R Bell Ext.6137

Model Railway

Despite the fact of not having a club room for some considerable time due to the removal of R15, the club still lives on. Membership is now on the increase with a further increase expected with the arrival on site of our Appleton colleagues.

All potential new members are most welcome to the club A.G.M. to be held on Thursday, 25th September, 1980 at 12.45 hours in the R61 Conference Room. Come and join us in our attempt to get back on the rails by having a club room in R58 along with other members of the Recreational Society.

Music Club

This is a club for musicians of all standards.

Most active are the clarinetists led by Sid Broughton (Ext.285) of which there are two groups, beginners and more advanced players. A group of mixed instrumentalists also meet regularly, playing works of all periods.

The Handbell Ringers also plan to meet again in the Autumn.

Netball

Response at the beginning of the season was such, that two teams were entered in the SRC Netball Tournament. The 'A' Team managed to retain the Trophy that they won in 1979, whilst the 'B' team provided a strong challenge. A team was also entered in the Civil Service Netball Tournament at Gosport at the beginning of the year, where the challenge was much greater. Anyone interested in joining the teams, please don't hesitate to contact Sue Underdown, Sue Merrifield or Janet Charles on Ext. 495 - we need new blood.

REMAP

The REMAP Workshop has been kept running regularly in spite of the shortage of helpers since its inception in September 1976. Only two people now attend, one evening per week, in an attempt to continue construction of simple aids for handicapped children and elderly persons. Output is obviously meagre.

If you feel able to assist this worthy cause in any way, or wish to find out more about this country-wide REMAP organisation, please phone Mr P Hey, Ext 432.

Radio

The Amateur Radio Club is now housed in R58 and its equipment is in operation again most lunch-times. We hope to improve the aerial system during the coming months.

Table Tennis

The Club is a very active and successful one, running both a lunchtime and an evening league. Three teams are registered with the Didcot and District Table Tennis Association, and it is hoped that teams will be entered into the Oxford and District Table Tennis Association and the Oxford County leagues if enough support is forthcoming.

Prospective players of any standard - improvement is rapid in this Club - are very welcome. The season starts on 15 September and a pre-season tournament has been organised for 10 September. Reports on club activities appear regularly in the 'Bulletin'

Coffee at 'Cosener's'

Originally conceived to introduce the wives of visiting scientists to resident families, the mornings are now held for all Rutherford and Appleton Laboratory wives, and children too. We therefore warmly welcome anyone whose husband works or is associated with the Labs to drop in at The Cosener's House, Abingdon, for a cup of coffee on one of the appropriate mornings.

The dates for Coffee Mornings are published in the 'Bulletin'.

Lunchtime Music

Every type of music is featured in these recorded presentations which take place in the Lecture Theatre at 1230 hrs on the Wednesdays of alternate weeks starting on 1 October.

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