11th Issue

ORBIT

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The Journal of the Rutherford High Energy Laboratory

During the last week in April, 150 scientists from seventeen countries including Japan and the U.S.S.R., assembled at CERN to discuss "Sector Focused Cyclotrons and Meson Factories". Encouraging progress on the smaller machines was reported, and some very ambitious proposals were put forward for meson factories to operate between 500 and 900 MeV. Among the more interesting ideas in this class was the "beehive" accelerator, worked up by F. M. Russell of the National Institute during his stay at Oak Ridge National Laboratory, U.S.A., which we hope to describe in a future issue. Meanwhile, we publish articles by J. D. Lawson on the VEC, and D. J. Clark on The Evolution of the Sector Focused Cyclotron.

The Variable Energy Cyclotron

J D Lawson

Most accelerator projects have been initiated either by nuclear physicists, or by machine builders who have seen what can be done, and believed that their machines would be useful when the time came to use them. The Variable Energy Cyclotron, or VEC for short, is an exception, in that the initiative came from the Chemistry Division of A.E.R.E. Indeed, the formal beginning of the project can be attributed to two papers, by Dr. Wild and Mr. Walton in 1958, pointing out the need for a machine of moderate energy, variable if possible with high intensity and the ability to accelerate different types of particle. A special requirement, to avoid confusion in the study of time dependent chemical processes, was that the beam should not contain frequency components below about 1 mc/s; this ruled out the possibility of using a linear accelerator. A further requirement, for a proton energy of at least 50 MeV for fission studies, excluded the possibility of a Tandem Van de Graaff machine, which otherwise had many attractions.

About this time the group at the Oak Ridge National Laboratory, under Dr. R. S. Livingston were preparing plans for their "General Research Accelerator", a multi-particle variable energy cyclotron (later to become ORIC). At N.I.R.N.S. we were still considering the "conversion" of the A.E.R.E. 110" cyclotron, but were unhappy because it did not seem as easy as we had originally hoped. A short paper was written in November, 1958, on the possibility of a "Chemists' Cyclotron", and from that time discussion continued while hopes fluctuated. A step forward was made when metallurgists realised that such a machine would be a powerful tool in their study of radiation damage mechanisms. The well defined energy and directional characteristics of the charged particle beam can provide information complementary to that obtainable from the omnidirectional neutron flux available in reactors.

After much hard work and discussion inside A.E.R.E. a request was made early in 1962 to the Treasury for £1,600,000 for the design and construction of a cyclotron and its building; this case was based on the use of the machine for chemistry, metallurgy and solid state physics. No special provision was made for nuclear physics, though interest in this direction is now becoming evident.

Treasury approval was obtained in April, 1962, for a cyclotron whose main features had already been worked out in some detail by the "Accelerator Research Group", now known as the Cyclotron Group.

Briefly, the machine is an isochronous cyclotron with three spiral ridges on the 70" diameter pole, and an array of poleface windings to enable the magnetic field configuration to be altered for different particles and energies. Protons will be accelerated to 50 MeV, deuterons and alpha particles to at least 25 and 50 MeV respectively, and heavier ions (nitrogen and neon nuclei for example) to an energy determined by their charge to mass ratio. We hope for extracted currents of up to 100 microamps of the lighter particles.

R.F. power is supplied to the single dee from a Marconi broadcast transmitter, which delivers up to 250 kW and can be tuned over a frequency range of 3:1. The dee is supported on the inner of a massive concentric line the resonant frequency of which can be varied with a moving short. An electrostatic deflector will extract the beam which will pass through a bending magnet, and then through a switching magnet into one of three shielded target rooms. Further details of the cyclotron are set out in a paper presented a year ago at the Los Angeles conference on Sector Focused Cyclotrons, published in Nuclear Instruments, Vol. 18-19, page 114. Copies are available from Cyclotron Group.

The building, which is the responsibility of the Southern Works Organisation, is rapidly rising opposite building 220. Most of the reinforced concrete for the vault and main target rooms has now been laid. In the late autumn, the magnet, the parts of which are now being machined, will be assembled in the vault, ready for its first tests early next year. By the end of next year assembly of most of the components should be complete, ready for commissioning in 1965.

This project, undertaken for A.E.R.E. in close co-operation with them, typifies well one of the aims of N.I.R.N.S. as set out in its Royal Charter (section 4(e)).

"To co-operate with the United Kingdom Atomic Energy Authority in the solution of specific problems in the field of nuclear or related research".

The Evolution of the Sector Focused Cyclotron

D J Clark

The cyclotron was developed by E.O. Lawrence in California in the early 1930's. The secret of its success in accelerating nuclear particles to high energies is that the time for a charged particle to make one revolution in a magnetic field is independent of its speed. If the voltage on the "dee" accelerating electrodes, alternates at the same rate as the particle revolves, acceleration will take place and the particle beam will spiral outward from the centre. Thus a particle is accelerated many times by the dee. This was a significant advance over the linear accelerators and Cockcroft - Walton high voltage sets of that time, where a particle used each accelerating gap just once. The cyclotron went from the original glass and sealing wax 4 inch diameter version in 1931, to a 60 inch diameter pole in 1939. The energy correspondingly increased from less than 1 MeV to 10 MeV for protons.

The energy of this first generation "fixed frequency" cyclotron was limited because the particles became more massive as they gained energy, according to the predictions of Einstein's relativity theory. This caused a particle's revolution time to decrease so that it became out of step, or phase, with the accelerating dee voltage. For example a proton at 20 MeV is 2% heavier, and revolves 2% more slowly than when it starts at the cyclotron centre. Another condition for successful acceleration is that the particle beam should be confined between the magnet poles in a space some 2 inches high. If particles head away from this space they must be forced to return by magnetic focusing forces. This vertical focusing was achieved in the fixed frequency cyclotron by causing the magnetic field to decrease near the edge of the magnet. This decrease actually made the phase problem worse, since it caused the particles to go even slower at large radius. So the energy of this first generation cyclotron was limited to about 20 MeV for protons.

One solution to this energy limitation was provided by the discovery of phase stability in 1945. Here the frequency on the dees was reduced periodically to match the decrease of revolution frequency of the particles as they gained energy. The development of this second generation frequency-modulated or synchrocyclotron was quite successful. The Harwell 110 inch cyclotron is of this type, giving 180 MeV protons. Energies up to 700 MeV have been obtained at Berkeley, CERN and in Russia. The disadvantage of this design is that the beam is pulsed at about 1% duty cycle, giving average beam currents of about 1 micro-ampere, compared to hundreds of micro-amperes for the fixed-frequency type.

In the search for higher intensity cyclotron beams, designers in the 1950's recalled a theoretical paper by L. H. Thomas written in 1938. He proposed putting 4 iron sectors on each pole of a fixed-frequency cyclotron. These would

(SECTOR FOCUSED CYCLOTRON Contd.)

scallop the circular orbit and act as magnetic lenses to give much stronger vertical focusing forces. These forces would replace those previously obtained by decreasing the magnetic field with increasing radius. Now the field could actually increase with radius and compensate for the phase-slip due to the increase in particle mass. The beam would be continuous, with currents of hundreds of micro-amperes. Energies up to 800 MeV were visualised. This principle was tested with electron model "Thomas cyclotrons" at Berkeley in 1950-52, simulating protons up to 150 MeV. Thus the third generation of "sector-focused" cyclotrons was on its way. To obtain more focusing the sectors can be spiraled, and this is usually done in present designs.

In the last few years the sector-focused cyclotron fever has spread through nuclear physics laboratories in the U.S. and Europe. There are now 13 of these machines in operation and 29 more in the study or construction phase. In the U.K. there is a Thomas cyclotron at Birmingham and of course the VEC under construction by the N.I.R.N.S. team for A.E.R.E.

Spiral sector cyclotrons in the energy range 500-800 MeV are under study at CERN, Zurich, Oak Ridge and Los Angeles. There would be serious radiation shielding problems and concrete shielding walls would have to be as much as 35 feet thick. A cost estimate for one of these installations is £11,000,000, or about the same as the big CERN or Brookhaven synchrotrons. Their designers are now tackling the formidable task of convincing their respective governments that such an accelerator is important for the advance of nuclear physics.

Symposium on

Neutron Beam Research

G. L. C.

At the present time a number of University groups, some with Institute support, are using neutron beams from the high flux reactors of the Atomic Energy Authority (DIDO, PLUTO, at Harwell and HERALD at Aldermaston) for a range of investigations in the fields of crystallography and solid state physics. Because the number of people either already involved or potentially interested in these types of experiments is steadily rising it was felt that a useful purpose would be served by having a meeting for the discussion of common problems. Accordingly a one day symposium was held at the Rutherford Laboratory on Wednesday 1st May, attended by about forty people from the Universities, the A.E.A. and the Institute.

Dr. Pickavance opened the discussion by explaining the role of the Institute in supporting University use of research reactors. Special mention was made of the recent arrangement with Aldermaston, whereby the Institute are hiring about one quarter of the total facilities on the 5MW reactor HERALD for University use. This was followed by a brief account from Dr. Cochran, of the Cavendish Laboratory, Cambridge, showing the important role of the neutron beam technique in studying the lattice dynamics of crystals. Dr. Bacon of A.E.R.E., (soon to take up the post of Professor at Sheffield), then surveyed the field of neutron diffraction, particularly the recent important work revealing the highly complicated magnetic structures of solids.

The afternoon session was devoted to accounts from two of the teams at present carrying out experiments on HERALD. Professor Mitchell of Reading showed how, by measuring the absorption of slow neutrons in solids, valuable light could be thrown on the nature of lattice defects and irregularities in crystals; Dr. Walker of Birmingham outlined the scope of his inelastic scattering measurements which are directed to understanding the mechanisms by which neutrons are slowed down in reactor moderators.

From the general discussion it was clear that there is already a considerable and growing interest in the use of neutron beams for the types of experiment described and it was well brought out that the technique is regarded as one offering very considerable potential for further studies into the nature and structure of solids. It will be interesting to see if the general expressions of interest from those new to the field will materialize over the next few months into firm proposals for new experiments.

Perhaps a sign of the developing social status of the National Institute can be seen in a recent acquisition for the Rutherford Laboratory Library. The book resplendent in a silver dust jacket is called "TITLES and FORMS OF ADDRESS" and conveys such useful information as "How to address wives of younger sons of Marquesses and Marchionesses"..etc...

A special chapter is given to Irish Chieftains giving a list which includes however "certain chieftains whose pedigrees have not been finally proved."

The majority of us will be directly involved only in the chapter headed ESQUIRES where we are told that there persists an "almost universal use of this title for every man who cannot claim a higher one..." And furthermore..."it is considered rude to address an envelope to anyone above the rank of working man as Mr."

The Accelerator World

The Berkeley Bevatron which began operation on 13th February after its major overhaul had achieved at the end of March a beam intensity of $2.3.10^{12}$ particles per pulse at 6.2 GeV. This intensity is expected to reach an optimum of about 5.10^{12}.

SAMES (Societe Anonyme de Machines Electrostatiques) Grenoble, France who supply the high voltage set for the DC Gun of the Nimrod Injector, have just completed their 40th particle accelerator. The latest machine for Helsinki University is identical to the model installed at the CEGB Berkeley Research Laboratory earlier this year.

The 3 GeV proton synchrotron built jointly by the Universities of Princeton and Pennsylvania was successfully operated at full energy with a pulse rate of 19 per second on 16th April.

Construction of the electron synchrotron DESY at Hamburg, Germany is progressing well. Assembly of the main machine components is expected to be complete by the end of 1963 and the first beams are predicted for mid 1964. The output energy is now quoted as 7.5 GeV with a beam intensity of about 10^{11} electrons per pulse.

The Heavy Ion Linear Accelerator built at Manchester University has successfully accelerated alpha particles to 40 MeV with a current intensity of 120 microamps.

It was announced in Parliament on 19th March that a grant of about £1 million has been given to Glasgow University by the Department of Scientific and Industrial Research for the construction of a 100 MeV electron linear accelerator.

The accelerator will be built on the site of the National Engineering Laboratory at East Kilbride adjacent to the Scottish Universities Reactor Centre. It will be used mainly for an extensive programme of investigations into the interactions of high energy photons. It should produce photon beams some 10,000 times more intense than those normally used in this work. With these high intensity beams, homogeneous quanta can be obtained by positron annihilation which will greatly improve on the accuracy in this field up to the present time. The accelerator will be available for use by other universities.

Polarised Targets

Owen Chamberlin and colleagues at the Lawrence Radiation Laboratory, Berkeley, U.S.A. have achieved a high percentage of polarisation in a target suitable for use with High Energy Accelerator.

Previous attempts have failed because the weakly magnetised proton is easily thrown out of line by thermal vibrations. Even cooling to within one degree of absolute zero in a magnetic field of 20 kilogauss only produced about 0.1% polarisation. The method used at Berkeley was proposed by Carson Jefferies and involves using rare earth ions which are 700 times more strongly magnetised than protons. Rare earth crystals were made containing a good deal of water to bring the protons of the hydrogen nuclei into close proximity to the strongly magnetised ions. Feeding in radio microwaves then transferred the ions polarisation to the neighbouring protons.

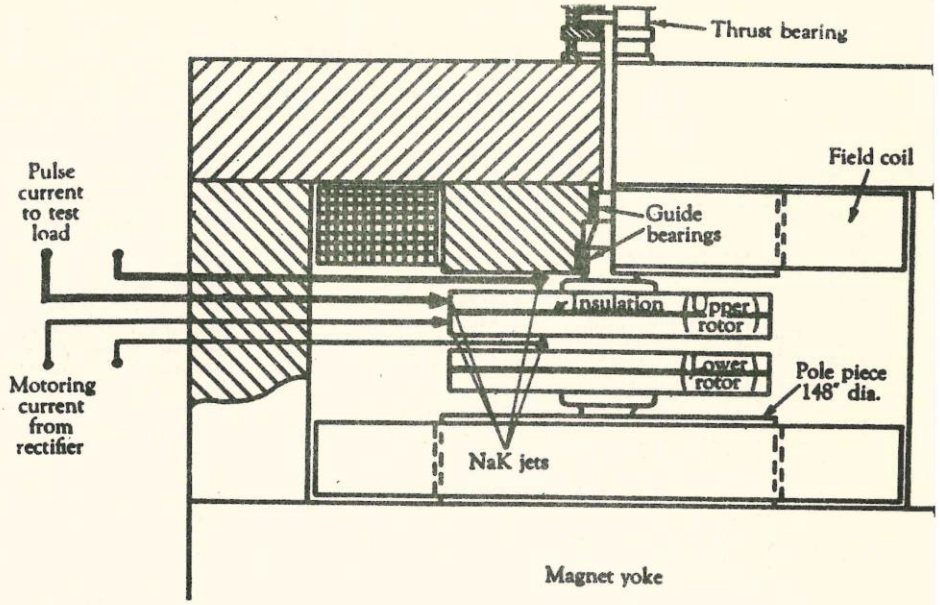
Crystal samples weighing up to an ounce have now been prepared with 20% polarisation, that is with 60% of the protons aligned parallel to the magnetic field and 40% anti-parallel, and it is expected that refinements in the techniques will bring further improvements.

In some of the first experiments at Berkeley to use the new targets, proton and π meson beams polarised parallel and anti-parallel to the target protons will be used in scattering investigations. These experiments will help to show the effect of spin on proton-proton and meson-proton interactions.

Homopolar Generator (Australian News and Information Bureau)

In Canberra, Australia a team at the Research School of Physical Sciences (Director - Sir Mark Oliphant associated with the Birmingham 1 GeV synchrotron) has carried out successful initial tests on a homopolar generator.

The generator was intended to provide a current pulse into the orbital magnetic field coils of an ironless proton synchrotron of 10 GeV energy. The sinusoidal pulse is required to have a peak current of 1.6 million amps with an open circuit voltage of 800 volts. Stored energy in the two rotors each weighing 40 tons at 900 rpm is 5.10^8 joules. This high current is collected from the rotors by continuous sheet jets of liquid metal (sodium-potassium alloy) impinging radially around the periphery of each steel disk and vertically along a magnetic field of 16 kilogauss. The generator is filled with pure nitrogen at near atmostpheric pressure.



The figure shows the arrangement used in the initial experiments to test the effects of full current operation. The lower disk of the upper rotor is driven as a Faraday disk with current flowing radially between four equally spaced jets on a circle of 24 inch radius to four similar jets at the periphery.

A series of pulses up to 1 million amps has been achieved at potential differences up to 66 volts. The results so far are very encouraging and agree closely with the design predictions. The tests have provided interesting observations of the behaviour of liquid current conductors moving in a magnetic field which are in accord with expectations from simple magneto-hydrodynamic considerations.

Stanford

Contracts totalling over a million dollars have been placed with R.C.A. and Sperry Gyroscope Co. by Stanford University to provide the first 144 high power klystron amplifier tubes for the 20 GeV electron linear accelerator.

The klystrons are required to provide 6 to 24 megawatts peak power output and must be capable of easy maintenance and mass production. The first tubes are scheduled for delivery within the year.

Work at Stanford University on the use of semiconductors in klystron tubes was recently reported to the American Physical Society. Thousands of millions of watts are needed to accelerate the electron beam in the Stanford machine and the accelerator has to be pulsed because of this power requirement. For example the 20 GeV machine will produce an electron beam for only one thousandth of the total operating time.

Most of this power is converted into heat by electrical resistance in the klystron tubes. Firbank and Wilson studying the electrical characteristics of superconducting microwave cavities think that a 30 MeV 100% duty cycle or a 1 GeV machine in operation for one tenth of the time should be feasible. Lead and tin plating of the inside of the cavities have proved most successful and further work is planned with other metals such as niobium.

Russian Accelerators

Construction of a 60-70 GeV proton synchrotron is underway in the Soviet Union and Russian scientists are working on the development of a cybernetic accelerator capable of producing intense beams of many times that energy according to details released in Moscow on 7th May.

Academician A. Mints reported that the accelerators were being constructed under a ten year programme launched two years ago. He considered it expedient to build proton machines in the 300 to 1000 GeV range and claimed that, although there were still numerous difficulties to overcome, energies in that range would be possible with the projected cybernetic accelerator.

Daresbury Visited

A H Spurway

In February four members of Staff Side visited the site of the Electron Laboratory.

Many Southerner's views on the North are quite clear. The North is that part of England which lies beyond the Midlands (which are themselves well known to be both sodden and unkind) and is inhabited by a race of peasants who speak an incomprehensible dialect and live on cow'eels, tripe and onions, beer, tea and fags. The men wear flat caps, no ties and silk scarves. The women wear shawls and clogs. Both sexes earn an uncertain living appearing as extras in films such as "A Taste of Honey", "A Kind of Loving" and other examples of earthy realism. The countryside is dominated by slag heaps, gasometers, pitheads and derelict warehouses, the parts in between being filled by uniform rows of terraced hovels coated with a thick, century old, layer of soot. There is no grass and it always rains.

Rutherford Laboratory staff who are thinking of transferring to the Electron Laboratory will be relieved to learn that this is not a true picture of Daresbury. The site of the Electron Laboratory is at present two large fields beside a small canal crossed by a little hump backed bridge. The outlook is completely rural. The canal was frozen over when we saw it but we were assured that the water is clean - it is a popular spot for fishing and carries a large amount of pleasure craft in the summer. The Laboratory restaurant will be built on the banks of this canal.

Daresbury itself is a tiny village with a pub, a church and a scattering of houses. This picture may change when Runcorn is expanded into a new town but the present plans do not stretch right out to Daresbury. The surrounding countryside up to the Mersey is fairly flat with an occasional outcrop of hills. One of these, Helsby Tor, a local beauty spot, is about seven miles S.W. and is National Trust property. Delamere Forest lies to the East of this. The whole area is rather more heavily populated than North Berkshire but is still predominately rural and forms a commuter belt for people working in Liverpool, Warrington, Widnes and Runcorn. These towns correspond much more closely to the South's distorted view of the North. Liverpool itself is a dirty, nineteenth century, industrial town with great areas of decay. And one cannot begin to describe Widnes.

However we expect that most N.I.R.N.S. staff will live in Cheshire, within an area roughly bounded by the Mersey in the North and a line drawn through Warrington, Northwich and Chester. There are residential areas here in Stockton Heath, Frodsham and Helsby and as we have said the area is predominately rural and quietly pleasant (Chester itself is a delightful town). Further afield the Pennines and the mountains and coast of North Wales are quickly reached by car and Liverpool and Manchester are close for cinemas, concerts, theatres and shopping. Houses for letting are as scarce as elsewhere, but Runcorn R.D.C. will advance mortgages of up to 95%. House prices seem to be about £300-£500 lower than for a similar house in Berkshire and there appears to be more of the cheaper type of property.

The Director of Education for Cheshire is, rightly, very proud of the Cheshire Education Department. Its total expenditure is £14 million (1961/2) compared with £7 million in 1955/6. (This is from a total County expenditure of £21 million and £13.5 million). There is no 11 plus examination, the policy being that all children who can benefit from a grammar school are sent to one. The pupil is continuously assessed at primary school and there are also late transfers from secondary modern to grammar schools. As a result about a third of all older pupils go to grammar schools compared with 23.3% for Berkshire. The Director said that in one particular area two thirds of all the pupils above 11 went to grammar school. The emphasis throughout seems to be upon a very careful examination of the individual child's potentialities and problems, in fact a record of each pupil is kept at the County Hall. There are three Colleges of Further Education in Cheshire, two more are being built and a further two are planned. Subjects which are not taught in Cheshire can usually be studied in Manchester or Liverpool. (Roger Childs has lists of local house agents together with some copies of local newspapers and specimen house prices. He also has the Cheshire County Handbook, "Education in Cheshire" and a guide published by the Runcorn R.D.C.

About 250 people will be employed at the Electron Laboratory; about 80 of these being of professional calibre. Professor Merrison intends to recruit wherever possible from the Rutherford Laboratory (even down to junior staff). It should be a very pleasant and exciting Laboratory.

DANCE on May 31st

The N.I.R.N.S. branch of the Civil Service Clerical Association have organised a DANCE in aid of the Freedom from Hunger Campaign to be held on Friday 31st May in the Canteen, Building 150. Tickets are 10/- each, available from:-

Margaret Snow	R.12
Shirley Marshall	R.25
Christine Snow	R.1
Barry Briscoe	R.1

OXFAM Collection

Miss J. Towers would like to thank all the people who made contributions during the recent exhibition in aid of the Oxford Committee for Famine Relief. A sum of £13-2-7d. was collected.

If anyone would be interested in contributing either 1/- or 2/6d. once every month as part of a pledge scheme would they contact:-

Miss Towers,
Room 1.52, Building R.1. Ext. 253.

Editorial

Many lectures given at the Laboratory attract and hold a wide audience but there are naturally some directed to specialist groups. It is as important to meet the specialist requirement as it is to cater for a general audience if not more so. During the past month attendance at one of these lectures which proved quite incomprehensible sparked off a few thoughts.

It was obvious from a cursory inspection of the assembled faces that for many the lecturer might just as well be speaking in Serbo Croat. And yet for the rest the lecture was so lucid that private jokes in the language were exchanged and enjoyed. For example... "But we could consider the integration between plus and minus infinity!" Delighted laughter from half the audience, embarrassed shuffles from the rest. Or... "We might write $ZZ' = 1+Z(Z+1)+..$" Near hysteria from those in the know; aggravated feelings of inferority for the remainder. And so on. No doubt the integration implied something like the neutrino having a large mass and the series expansion involved the disintegration of quantum theory (and who wouldn't be hysterical at that).

Accumulation and assimulation of knowledge continues to accelerate and the frontiers of mans knowledge sometimes seem, like the distant galaxies, to be moving away from us at near the speed of light. To reach the frontiers and to stay there only a very narrow track can be covered. Few versatile minds can really master a broad range of topics. And this specialisation does not apply only to science. Who knows but that in some learned Academy of Music some analyst is at work on "The Role of the Consumptive in Grand Opera". Or that some devoted literary scholar is investigating "The Impact of Shakespeare's Arthritis on the Imagery in 'King Lear'".

Did we smile? Are these any more narrow channels of investigation than say "Zig Zag Twins in Zirconium" or "Generation of Photon Beats from a Microscopic Viewpoint". (Titles from a recent randomly selected Information Bulletin.) It is the "microscopic viewpoint" we need to be careful of.

The further we advance it seems that for most of us the more narrow and detailed the application must become. And yet in parallel it is essential to see particular work in the perspective of what is happening in other areas of human effort. How else is it possible to decide whether it is more justifiable to provide a communications satellite or to finance an irrigation scheme in India? How else can a decision be taken on increased grants to the Arts Council for support of provincial theatres as opposed to greater outlay on cancer research? Questions like this can rarely be given clear cut answers but one thing is certain - anyone who makes no attempt to see his own work in the broad context of human affairs is not qualified to answer them.

Of course the Egyptologist, the Historian, the Archelogist will clamour for millions of pounds to preserve the Abu Simbel temple from the waters of the Aswan Dam. That is the area of his specialisation and he can see the importance of this as part of man's heritage. Of course the Accelerator Physicist, the Nuclear Physicist will clamour for millions of pounds to build more and higher energy accelerators. That is the area of his specialisation and he can see the need for the information that only these machines can provide.

But if effort and resources from the rest of mankind are needed to support the specialist work then the rest of mankind has the right to know why the contribution is necessary.

It is up to the specialist -
First, to keep abreast as well as he can with other fields. Then he will appreciate his particular position in human activity and, given a sense of responsibility, will not manipulate his specialist knowledge to press for more than can be justified in a broad context, regardless of the strength of his case within the field itself.

Second, to translate his own work as best he can for the information of others. This will be his contribution to the "broad context" and in this translation others should be able to assess to some extent the relevance of his particular needs.

Letters to the Editor

Letters may be addressed to "The Editor, ORBIT, Building R.1". Pseudonyms are accepted provided the authors name is known to the Editor.

Sir,

Now that the Rutherford Laboratory is officially described as being in Chilton is it intended to refer to the staff as the "Chilton Hundreds"?

Curious

Sir,

Dr. Valentine informs us "The decision to use numbers rather than names for the roads was a conscious one taken at the Building Committee". Can anyone spare the time and effort to compile a list of the unconscious ones?

K. Oed.

Sir,

I would like to draw your attention away from the rather childish discussion on revolving doors to a matter of genuine importance. This is the shower of drips which comes off the edge of the overhanging bit of R.1 above the main entrance in wet weather. All the rain striking that face of the building presumably runs down, collects at the bottom, and drips off the edge producing a most unpleasant curtain of drips through which anyone wishing to enter has to pass. Could not R.1 be tilted slightly so that it all ran off one corner?

P. F. Jones

Outside Hours

Always With It

E G Higgins

If you have heard of a busman's holiday you'll not be surprised to learn that at least one engineer's pastime is engineering.

Motor vehicles, now, they had an odd fasination for me, even in the long past days of my youth when the only possible transport for my budget was an old heap with two wheels. Considerable pleasure was derived from pulling them to pieces and putting them together again. This pleasure was heightened when on waking for another days toil I saw big ends and little ends, pots and valves and things strewn all around. Yes - the bedroom was also the garage in those far off days.

Then of course there was the three wheeler that had to be rebuilt after a prang. That prang had one outstanding success - the girl friend in the quiet moments between X rays, bone setting, stitches and so on decided I was the one for her - I've never regretted it, but I can't speak for her.

There was always one big snag, even when the first car (20 years old) was acquired - the time factor. Every job had to be finished in time for a day by the sea or to fetch ma-in-law or something. You'll have guessed by now that most of the fun is gone when the job is done. The joy only comes with the oily hands, the nut that rolls behind the bench and with the spanner that won't fit.

One of the turning points was coming to Harwell, till then for many years it had been a motorcycle for work and a car for the family, a most excellent working arrangement. Harwell and its buses, pressure by wife and increasing years, combined to show that some 23 years of motorcycling were over. Not without a struggle however. A box of moped was bought for a fiver and provided many happy hours. I think the well known personality at N.I.R.N.S. who bought it eventually, will agree it was good value even if it did yield over 100% net profit.

Then the family began to grow up - no son or heir - but the love of motors appears to be inbred I'm happy to say. So we became a two car family - Higgins Third Law states that for complete satisfaction the number of motor vehicles per household must equal the number of qualified drivers contained therein. (The two earlier Laws will be disclosed in good time.)

So a Big 7 was acquired for £6. This brought many hours of toil, lost skin from knuckles, etc., but what could be better on a lovely spring morning with apple blossom dropping pink confetti at ones feet and into the paraffin bath. Here there was no real time factor for the mass produced tin and glass box is there for the family to use and how nice it is to be able to jump aboard and pop into Oxford for an oil seal or to the breakers for a "new" engine.

Oh yes, breakers, the old adage about the little girl applies - when they're good they're very, very, good, but when they're bad they're b———y! I found a good one less than a 1000 miles from Harwell who had a crashed Big 7. What a find and Bert knew its history too. Its engine for a fiver is still going strong after at least 20,000 miles. And there was the gearbox and steering box and loads of O's and S's.

That member of the family now has a boy friend with his own transport so the 7 went the way of all the others - sold to an undergrad. at 250% profit above purchase price, and a bargain at that too. Now another daughter approaches 17 and this time its a bit more quality, an M.G. P.A. for £20 with new tyres, battery and £3 from tax refund. This one I'm pleased to say is still a long way from being on the road. What fun it is - there is a bunch in the M.G. Car Club who are real enthusiasts for these flighty little tubs and are they keen!

One is put in touch with someone who has some spares for a nominal sum and with the goods come pages and pages of hints, tips, advice and just plain memories. What a happy band of brothers they are. One has to be careful though - a severe attack of this fever is not compatible with normal family life. The garden? - who cares; the decorations? - a wash by the lady of the house and they'll go on for another year; that meeting? - shall miss that tonight. This sort of answer comes all too readily for Higgins 2nd Law must be obeyed, "Time spent on that car must not exceed 95% of total time available". And the First Law states that real age increases in direct proportion with the dislike of dirty hands.

The only thing that worries me - I have no more daughters. There is one minor consolation, an acre of grass does demand a motor mower and my wife reminds me that one can now obtain a model which also carries the operator

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A letter addressed to SAMES, Grenoble, requesting details of six of their generators and pressure vessels emerged from typing with the final sentence reading -

"Also... please send... details of all welds and materials of construction of all the above sex vessels."

The Rutherford Laboratory

RESTAURANT

J M Valentine

With a bit of luck you should be eating your first lunch on Monday, 15th July. Having said that I shall now deal with the rest of the details in some sort of order.

Perhaps the first thing that should be said about the restaurant is that we hope it really is going to be a restaurant and not a canteen. A combined effort by everyone is required and I suggest that we all (Orbit included) start by thinking of it, and referring to it, as a restaurant.

The building itself is nearly finished. If all goes well we expect the completed building to be handed over by the contractors at the end of June. The main restaurant space will seat 240 people at 60 tables. In addition, there will be a small coffee lounge which will be extended when the lecture theatre has been built. In order to make the best possible use of space it has been decided that there will be no waitress service. The self-service will operate as follows. A customer will put his meal on a tray in the usual way. He will place the whole tray full of dishes on the table leaving the dishes on the tray throughout the meal. After he has finished he will be expected to take his used tray back to the disposal unit near the servery. This system asks for a fair degree of co-operation from the customer but we feel that it offers considerable advantages. There should be no piles of dirty dishes left lying about, nor rounds done with a macabre dirty dishes trolley. In the centre of the circular dining room there is a dispensary for hot and cold drinks and cold snacks. If there is a big demand for tables in the restaurant we hope that members will help by drinking their after-lunch coffee in the lounge.

Who is to supply the food? This is clearly the key question and it has been considered, debated and written about for over a year. The final answer is that we have asked a commercial firm, Staff Caterers Ltd., to provide a catering service for us. They will be paid a management fee by the Institute, who will also supply the usual subsidy in the form of heat, light power and cleaning services. The cost of the meals will have to be adjusted in the light of experience but charges are likely to be similar to those in A.E.R.E. canteens: we hope the quality of the food will be higher. All the details on visitors' meals, meals outside working hours and so on have not yet been worked out but each point of principle has been settled. They will not be subsidized by the charges for normal lunches; the Institute will bear <u>excess</u> charges of this kind.

In order "to consider matters arising in connection with the restaurant and to advise the Director of the Rutherford Laboratory" a Restaurant Committee has been set up. The chairman is Dr. J. Howlett and the secretary Mr. E. W. Young. In addition there are another two members appointed by the Director, three members from the Staff Side of the N.I.R.N.S. Whitley Council, two members from the Trade Union Side of the Rutherford Laboratory Joint Consultative Committee and one representative of the Radiobiological Unit of the Medical Research Council. The committee has met three times and made a number of recommendations which have been accepted. Probably the most important of these is the one concerning the type of service. A good deal of thought and discussion went into the decision to abandon waitress service in favour of a completely self service restaurant. In this respect we shall be adopting a system that is reported to work well at C.E.R.N.

It took the committee less time to agree to recommend no smoking in the dining room (smokers to be concentrated in the coffee lounge) and to ask for a reasonable standard of dress in the restaurant. For example, protective clothing should not be worn. Other matters not yet resolved include the possibility of a licence. The combination of a restaurant licence with self service raises such awesome difficulties that we have had to seek (through Staff Caterers Ltd.) expert legal advice. Either the freedom of C.E.R.N. or the prohibition of Mississippi would be easier to deal with; here we seem to have varying degrees of impossibility.

As I started by announcing, the first working day for the restaurant will be 15th July. This is the date for the Governing Board Meeting at the Laboratory so we hope to arrange an official lunch and opening ceremony on that day. The previous Saturday, 13th July, is the Rutherford Laboratory Open Day. Teas, at about 2/6d. a head, will be served in the restaurant. Let us hope no further catastrophes, snowstorms, floods, financial crises or acts of God, intervene.

SORT THIS ONE OUT -

1 stone
1 pig
1 hairstyle
1 singer
1 ruler
three
1 headdress
1 leatherworker
North and South Poles
1 bicycle

£26-8-9¾d.

Diner Dansant

It was decided not to hold the N.I.R.N.S. annual dinner and dance at the N.I.R.N.S. restaurant this year, in spite of the fact that that establishment is one of the rare few who can boast that they have never had a dissatisfied customer. So it was that on May 3rd we all descended on the Chicken-in-the-Basket, Benson, at 8 for 8.30, as they say. In attendance were 76 chickens, 29 steaks, 53 bottles of wine, and the Orchestre Moderne from the Marie Antoinette Conservatoire, Didcot. 104 people arrived, 52 of each sort, which just goes to show, but the evening was marred by hearts heavy with the thought that back in the injector control room some of our worthy colleagues were working on through the night. One of these stalwarts was named Jack, or so I gleaned from a farewell remark made by one of his pleasure-bent comrades as he departed. I did not understand the response, which was presumably of a technical nature.

Nevertheless, an excellent evening was enjoyed by all, thanks to the impeccable organisation of Mr. Young and Mr. Tony Binks - mine jovial host. Before taking to the restaurant business, Tony was a bullfighter of some reputation; placards on the wall bear his name in bold, forged characters. He retired as a Wing Commander in 1956, and since then has made the "Chicken" one of the best road houses for miles around. (Advt.)

Personnel News

Comings and Goings

M. W. Coles, R. R. Powell and Miss P. Martin join Accounts.

R. J. Wilton joins Nimrod Injector; J. R. Sherwood joins P.L.A. Accelerator Physics.

D. U. Potts, P. A. Hibberd and H. Johnson join Nimrod Engineering.

P. A. Binding and Miss M. J. Kriegar join Theoretical Physics; Miss C. A. Woods joins the Atlas Laboratory.

F. J. Field joins Electronics; L. G. Hunt joins Administration; A. D. Heyes joins Nimrod Beams; R. W. G. Bignell joins Central Engineering.

R. Purchase has completed his Fixed Term Appointment.

Mrs. M. Gotch, Mrs. P. E. Bone, K. G. Fleetwood and W. W. Chicken have left us.

Through the eyes of a Woman

Handmaegden

After three years at Oxford, which naturally unfitted us women for anything except the quiet contemplation of man (at Oxford) for the rest of our days - after a month chasing huitres, homards et langoustines round the coast of France, and chasing chateaux up the Loire - we suddenly arrived at the point at which the adoption of a career became a financial necessity. A considerable number of us then married, but some of us didn't - Minette, for instance.

Much of the first couple of months of Minette's appointment at N.I.R.N.S. was spent in the basements of the A.E.R.E. Library, where besides learning something of the work one is to do, one possesses an individual electric fire. From her vantage point, Minette became familiar, as the sun rose daily over the whitened slopes of the two great mounds beyond, with the trail of tiny figures wending its way across the snowy fields past the anadyomene Atlas Laboratory. And so, when finally she was incorporated and absorbed in the stream, communion was immediate.

Minette now knows and loves the ebb and flow of faces and feet in that corridor of R.1 where the ranks of those who lose their dignity on the especially non-slip polished floors swell daily. She has told me some fascinating stories about some of the faces which I can hardly bear not to repeat as they are, of course, all very complimentary. But I expect I should give this space to Minette's fabby prediction of the menu for the first lunch in our new canteen.

She cannot imagine that the chef would be content with less than a perfect bisque de homard with which to begin, but she would like to advise as an alternative, for those with whom lobster disagrees, some slightly chilled melon. What then but a very, very plain light little omelette, cooked only one minute over the hottest fire imaginable, as a prelude to a filet de boeuf flambe a l'Avignonnaise with masses of tomates provencales. And, of course, a measure of reasonable claret. To finish, she imagines perhaps a St. Emilion au chocolat or les cremets d'Angers, before a well stocked cheeseboard. I told Minette that she was flying in the face of History, but her convictions are strong, and as, to her, N.I.R.N.S. is the epitome of directed scientific ability, she believes that the production of good food is inevitable. And, basically, I agree with her.

Minette adores the lovely, cheap buses which run all through the country lanes each morning and startle the sleepy villagers with their purple and orange flashes. She does hope they never get too expensive to ride on as it would take such ages to come to work on foot or even in the N.I.R.N.S. mobile crane she was once given permission to drive. And she doesn't think either of those two nice Rutherford Laboratory administrators could give her a little yellow van outside working hours, smiled she never so sweetly. She really digs those administrators, and says some of the scientists - oh, those scientists! - particularly in Theoretical Physics, are absolutely ... but Minette thinks you'll be a bit sick of her impressions by now, and she's just asked me to stop.