22nd Issue

ORBIT

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The Journal of the Rutherford High Energy Laboratory

Programme for The Week of the Opening Ceremony

Monday 20 April

Final preparation of exhibits

Rehearsal tour of the exhibits 10.30 a.m. – 12.00 noon.

Tuesday 21 April

Press Photographers Day

Photographers will be here from 11.00 a.m. and will visit exhibits from 12.15 p.m. to 1.30 p.m. and from 2.30 p.m. to 4.30 p.m.

Wednesday 22 April

Press Correspondents Day

Correspondents will be here from 11.00 a.m. and organised tours of the Laboratory will take place from 12.00 noon to 1.30 p.m. and from 2.30 p.m. to 4.00 p.m. A Press Conference will be held in the Lecture Theatre from 4.00 p.m. to 4.30 p.m.

Thursday 23 April

Final preparation of Nimrod for the inauguration ceremony.

Friday 24 April

Official Opening of the Rutherford Laboratory and Inauguration of Nimrod

Guests will arrive from 10.30 a.m. The luncheon, to be followed by the Opening Ceremony, will begin at 12.30 p.m. Speakers at the luncheon will be The Rt. Hon. Quintin Hogg, Minister of State for Education and Science; The Rt. Hon. The Lord Bridges, Chairman of the National Institute; Sir John Cockroft, Warden of Churchill College Cambridge; Professor Weisskopf, Director-General of C E R N and Dr. Pickavance, Director of the Rutherford Laboratory

Saturday 25 April

Laboratory Open Day

The Laboratory will be open for staff, their families and friends from 2.00 p.m. to 6.00 p.m. Representatives from outside contractors who have been concerned in the Laboratory projects have been invited to visit the Laboratory on this day.

At the Pressing of a Button

Though ORBIT has regularly carried progress reports and other articles on Nimrod, we have never yet described the machine itself. With the inauguration ceremony only a few days away this seems an appropriate time to sketch what should happen when the Rt. Hon. Quintin Hogg presses the button.

Ion Source; D.C. Gun

Nimrod is a proton synchrotron and the first requirement is obviously protons. They exist as the nuclei of hydrogen atoms and we therefore need to strip the electrons from the atoms to liberate protons. Hydrogen from an ordinary gas cylinder is fed into a glass bottle – the ion source. Here the molecules are broken into atoms and electrons are stripped off by the action of a strong electric field produced by passing pulses of radio frequency (r.f.) power through a coil wound round the source. This mixture of hydrogen atoms, protons and electrons is called a plasma. (A working source can be seen in Lab.6, R 1 on Open Day).

To get the protons out of the plasma an electrode is given a positive voltage pulse up to about 25 KV. (KV – 1,000 volts; MV – 1,000,000 volts; GV – 1,000,000,000 volts). We can think of the result as the positive protons being repelled from the positive electrode towards a negative electrode so that if a hole is made in the negative electrode the protons will stream out and we have a proton beam. This is accelerated by a d.c. potential of about 600 KV, supplied from a SAMES generator to the 'd.c. gun.' Some focusing takes place inside the gun to prevent the beam expanding and protons being lost to the walls of the vessel. Also a high vacuum is maintained throughout Nimrod so that the protons will not be scattered from the beam by gas molecules in their path.

L.E.D.S.; Quadrupoles

The beam, with an energy of over 600 KeV, now passes along the Low Energy Drift Space where it is prepared for the 'linac'. The equipment in the L.E.D.S. comprises 4 – jaw boxes (plates which can move across the path of the beam), probe boxes (where targets for example can enable us to look at the spot size of the beam) and quadrupole focusing magnets. A 'Buncher' serves to concentrate protons in bunches which arrive at the linac at the correct time to be accelerated.

It is worth saying a word about quadrupoles since they occur again in the injector and in beam lines in the Experimental Halls. In the quadrupole we have four magnetic poles alternatively north and south. Protons in one direction are pushed towards the axis of the beam (Fleming's Left Hand Rule for those who reached 'O' level physics) while those in the direction at right angles are pushed away and a beam which was circular in cross section emerges looking like an elipse. It is then passed through another quadrupole where the north and south poles are reversed. The overall effect of passing through a series of magnets like this is a focusing one. On the injector, the quadrupoles (three of them are used together as a triplet) are quite small since the magnets need not be very powerful to bend the protons with their quite small energies. By the time the beam is at 7 GeV, very powerful magnets are needed to bend the protons such as the large diamond-shaped quadrupoles in the Experimental Halls.

The Linac

The linac, or linear accelerator proper, is a copper cylinder, under the large D-shaped vacuum tank, into which is fed r.f. power alternating at a frequency of 115 megacycles per second. This sets up an electric field along the axis of the cylinder which swings from one direction to another 115 million times a second. When it is in the wrong direction for accelerating, protons are hidden from the field in drift tubes . When the field is in the right direction the protons emerge and are given a kick across to the next drift tube. Since the protons are going faster after each kick, the drift tubes have to be successively longer so that the protons are always hidden for the right length of time while the field changes direction.

The beam tends to be defocused as it passes between the drift tubes and to prevent many protons being lost, each drift tube contains a quadrupole magnet. The beam emerges from the linac with an energy of 15 MeV, travelling at about 1/6th of the speed of light. (The first 15 MeV beam was achieved on 1st August 1961).

H.E.D.S. and Inflector

The High Energy Drift Space performs an equivalent function to the L.E.D.S. and uses similar equipment, this time to put the 15 MeV beam into the right form to be received by the synchrotron. A 'Debuncher' reduces the spread in energy of the

AT THE PRESSING OF A BUTTON – cont'd

protons fed to the magnet ring. The beam enters the magnet ring after passing through an inflector system of four bending magnets followed by an electrostatic inflector.

The Magnet Ring

To explain what goes on in the magnet ring we will need to bring in the equation of motion of a particle of mass 'm', carrying charge 'e', moving at a velocity 'v' through a magnetic field of strength 'B'. The particle will follow a curved path of radius 'r' such that

$$\frac{mv^2}{r} = \text{Bev}. \quad \text{Then } B = \frac{mv}{er}.$$

Since e is constant, if we increase the energy of the particle (i.e. its momentum 'mv') then either

i) With a constant magnetic field B, r will increase. This is what happens in the cyclotron where the particles move out into a bigger radius curve as their energy is increased.

or ii) With r constant, as in the fixed radius of the Nimrod ring, B must be steadily increased as the energy of the protons is raised.

In Nimrod, the protons are bent round by the magnetic field. At the r.f. cavity, in Straight Section Box No.8, they are given a kick by an electric field which increases their energy by up to 7 KeV each time they come round. To ensure that they don't peel off to the walls of the vacuum vessel by moving onto a larger circle, the magnetic field is steadily increased. The proton energy can go from 15 MeV up to a possible maximum of nearly 8 GeV while the r.f. is varied in frequency from 1.4 to about 8 megacycles per second and the magnetic field is increased from about 300 gauss to a maximum of about 16,000 gauss.

A complication arises at high energies due to the change in mass of the protons (Einstein's relativity theory). The proton becomes heavier as the speed approaches that of light and to counter this, the rate of increase of frequency of the applied r.f. accelerating field is reduced. These are the basic rules of the synchrotron developed in 1945 by McMillan in America and Veksler in Russia. (The first 7 GeV beam was achieved in Nimrod on 27th August 1963).

To keep the beam focused as it is accelerated Nimrod uses the 'weak focusing'or 'constant gradient' method, which involves having the magnetic field strength decreasing going radially outwards from the centre of the magnetic ring. This focuses the beam. 7000 tons of steel are used in the Nimrod magnet yoke and 350 tons of coil carry the electric current to the octants.

Extracted Beams

By the time the protons have reached their peak energy, they have travelled some 100,000 miles and are travelling at near the speed of light. The beam can then be extracted by switching on special magnets and plunging them into position so that an external full energy proton beam is sent down a beam line. (An extracted beam was first achieved down the P1 line on 24th March 1964). Alternatively a target, such as a block of tungsten can be raised near the orbit of the beam and the beam directed on to it. (Target mechanisms are exhibited on Open Day in Heavy Lab. R 25). This produces many particles – neutrons, mesons, scattered protons – as the high energy beam crashes into the target. A beam of a particular type of particle can be selected for experiments down one of the beam lines leading from the magnet ring, by 'tuning' the beam line (setting its magnetic fields etc.) to reject all other particles.

That covers, in a general way, some of the principles and their applications which are involved in the operation of the proton synchrotron. For the machine to work when the button is pressed at the inaugural ceremony on 24th April, it can be seen that a large number of components have to be operating satisfactorily. The vacuum pumps have to establish a high vacuum throughout the machine; all the magnets and electrostatic lenses have to be powered; the r.f. circuits on the injector and the synchrotron have to be working; the large main magnet power supply has to be providing its huge currents, as high as 10,000 amps, to the coils on the octants; water cooling circuits have to be doing their job . . . . .thousands of separate functions by thousands of pieces of equipment, have to be fulfilled everytime a pulse of high energy protons is achieved.

On Open Day all areas of Nimrod – the Control Room (R 2), the Power Supply House (R 3), the Injector Hall, Magnet Room and the two Experimental Halls will be open to visitors. Many components of the machine will be specially displayed.

'BRILLIANT SCIENTISTS THEY MAY BE BUT IT MIGHT NOT BE A BAD THING IF THEY REMEMBERED THEY WERE SPENDING THE HARD EARNED MONEY OF OTHER PEOPLE, AND WE HAVE EVERY RIGHT TO EXPECT THEM TO MAKE THAT MONEY WORK JOLLY HARD. THEIR SOMEWHAT HIGH FALUTIN' MANNER ABOUT HAVING TO 'DEGRADE THEMSELVES' BY PERSONALLY USING A TYPEWRITER, DOES NOT EXACTLY INSPIRE CONFIDENCE IN THE HARD PRESSED TAXPAYER.'

W.R. VAN STRAUBENZEE,
M.P. FOR WOKINGHAM,
ADDRESSING THE SONNING BRANCH OF THE CONSERVATIVE ASSOCIATION.

The Accelerator World

Israeli Accelerator

A new Tandem Van de Graff accelerator which will be the largest in the Mediterranean area, is being delivered by High Voltage Engineering Co., U.S.A., to the Nuclear Physics Department of the Weizmann Institute of Science at Rehovot in Israel, at a cost of £1½ million.

The machine will be capable of accelerating particles to energies between 15 and 50 MeV. Research work is planned on nuclear reactions, electromagnetic properties of nuclei and in particular on magnetic moments and the life times of nuclear levels.

MURA Accelerator Shelved

The USA Atomic Energy Commission has supported research work in Wisconsin by the Mid-Western Universities Research Association (MURA), an amalgamation of 15 institutions, for about ten years. The principal research work has been concerned with a proposed high energy accelerator.

The Ramsey report which studied the future American accelerator programme a year ago, made a recommendation that construction of a 12.5 GeV high intensity accelerator by MURA at a cost of $150 million, should begin in 1965. However it qualified the recommendation by saying that this authorisation should not significantly delay authorisation of the steps towards higher energy, (200 GeV machine at Berkeley and a 600 – 1000 GeV study at Brookhaven).

Following the publication of the Ramsey report an extensive campaign in support of the MURA machine was launched by a group of senators from the Midwest. They maintained that failure to support the MURA proposal would endorse second-class status for the Midwest as a scientific and technical centre.

At the end of January 1964, the USA Atomic Energy Commission announced that it would not support construction of the 12.5 GeV machine and the MURA research work would be re-orientated toward new studies on the design of an accelerator of up to 1000 GeV energy. In this work they will be joined by scientists at the Argonne National Laboratory near Chicago and the work of the MURA scientists will eventually be centred at Argonne. Part of the plan involves collaboration with Brookhaven also, where these design studies are already underway. Ways in which MURA may participate more directly in the use and management of the Zero Gradient Synchrotron, which has recently come into operation at the Argonne, are being explored. MURA officials are not optimistic about holding their team together in the new circumstances. A committee is studying MURA's future.

P L A Spectrometer

On 2nd April the Director officiated at an Opening Ceremony of the N(½) Spectrometer in the P L A Experimental Area. All members of the P L A were present to hear a brief description by Dr. Hanna of the type of experiment which the nuclear physicists will be carrying out with this equipment. After this the Director operated the device and spectators were able to see the 30 tons of magnet, standing 16 ft. high, turn on its scanning track.

The spectrometer is possibly the biggest and most complex particle detector in the Laboratory now that the Bubble Chamber is at C E R N, and makes possible a new range of nuclear physics experiments with the P L A. First results from proton scattering experiments show that the instrument has reached the design specification for energy range covered (10 %), solid angle of acceptance and resolving power (0.1 %).

'Philip Frank spoke to Einstein one day about a certain physicist who had had very little success in his research work. He consistently attacked problems which offered tremendous difficulties. He applied penetrating analysis and succeeded only in discovering more and more difficulties; he was not rated very highly by most of his colleagues. Einstein said, "I admire this type of man. I have little patience with scientists who take a board of wood, look for its thinnest part and drill a great number of holes where drilling is easy." '

Retold by Chen Ning Yang
in his book 'Elementary Particles'

In the world-wide war against crime, there are men and women trained to sink their identities in the international underworld. They work alone, in darkness and in shadow, unrecognised by friend and enemy alike, the operators of the almost legendary .....INJECTOR GROUP.

We present

The Case of the Great Film Robbery

I crouched in the dark Control Room, panting. It had been a lot harder than I'd expected and I realised I was in poor condition. I decided to cut down to sixty a day and only one bottle of Scotch. There was a slight movement of a dark silhouette at the other end of the room and I tried a flying tackle. We crashed to the floor and rolled over and over. I was going for an arm lock when a knee was brought up hard into my stomach. I screamed. When I was able to stand I saw L's face on a TV monitor and then it went blank and I was alone in the room.

What the hell was going on?

People don't vanish into thin air. I dragged myself round the Control Room, holding on to the racks of electronic equipment. At the end of one block was a six foot Dynatron rack with no indication lamps lit and a strong smell of Chanel Number Five. There was something odd about that and my sixth sense told me to be careful. I shrugged my shoulder holster into a good position and flung open the side door.

She giggled.

"James darling, you look ghastly! I thought you liked it rough!"

I looked at her with my cold grey eyes. There was plenty to look at.

"Why are you wearing a bikini?"

"It's hot in these racks. They ought to use transistors."

My face was stinging and I felt it gingerly – my hand came away red.

"Let me wipe that lipstick off. Your face looks like an Intermittent Radiation Notice."

I pushed her back into the rack and locked her in. I curled my lips into a cruel smile .....well if she wanted it rough .....

The Le Mans type Bentley was just outside and I jumped in and roared off through the night towards London, the two big headlamp beams stabbing the darkness for half a mile in front. My brain was racing. Why had L sent me down to the accelerator 'just to get some background' and then turned up himself? I had seen him. Had this been deliberate? Had he seen me and the girl? And who was she? She seemed to know me. All that closed circuit television they used made me uneasy – you never knew when you were being watched.

When I got back to headquarters I was surprised to see L's office lit up and Susie at her desk. I was all in and held on to her typewriter. She straightened my tie and wiped the lipstick off but said nothing. Her eyes were bright. I went through to the inner office and saw L rummaging through his safe. He looked up sharply. He'd been damn quick!

"What made you come back 007/11/11?"

"Just a hunch, Sir." I didn't mention the TV monitor. I'd never seen him so edgy.

"Well I can put you in the picture a bit more now. We're up against your old pal Moriaty. He's running a large scale international traffic in scientific results. Important results these days cost so much to produce that certain foreign governments will pay high prices for the odd new particle – the prestige value of science has become that high 007/11/11! But you've got to be able to offer the whole works to get a sale – that means the original evidence, a few miles of film."

"So you couldn't deliver it in a hollow tooth."

"Exactly. We want to know how the stuff is taken out of the country. My information is that a new particle, -t, has just been discovered at the Rutherford Laboratory and I think Moriaty will try something there. By the way, the latest intelligence is that he's undergone plastic surgery to make him look like me."

So that was it! It was Moriaty I'd seen at the Lab.

"I'd like to go back there Sir."

"Well if you think you're on to something, go ahead. There's a little box of tricks here I've had made up for this job – you may need it. It looks like a portable oscilloscope and your cover story is that you're an engineer servicing equipment in the Control Room. There are fifty gold coins in the handle and the mains lead can be used as a garrotte. If you need help, press this button and a high frequency signal will be broadcast – one

THE CASE OF THE GREAT FILM ROBBERY - cont'd

of our operators will find you with a homing device. If you're really in trouble throw this switch and some selenium rectifiers will explode giving off noxious fumes to make your adversary vomit. Off you go and use this side door."

A panel of L's office wall swung open with a filing cabinet attached to it and I stepped out into the corridor. Very crafty. I hadn't known about that door – from outside it looked like an ordinary section of office partitioning, except that it was a slightly different grey.

An hour later I was coasting quietly up to the accelerator buildings in the Bentley. Inside the Control Room, I saw a light behind the long line of control cubicles. Creeping between two racks I cautiously looked through. There was Moriaty examining some film! The plastic surgery job was fantastic – I could have sworn it was L. My pulse was racing and I controlled an impulse to leap out and club him with the oscilloscope.....Be careful Bund.....Make sure this time.....

I felt for the button on the 'scope. Better have some help – swallow my pride. There was a loud 'plop' and a cloud of evil smelling fumes mushroomed in front of me. I vomited. In between retching I cursed.....Those fancy gadgets always let you down.....give me a Smith and Wesson any day. I must have pressed the wrong switch! Moriaty was coming towards me menacingly. Frantically, I pressed the other switch and a shower of sparks exploded as something hit me at the back of the head.

When I came round, I was in a hospital bed with L bending over me – or was it.....

"Don't excite yourself 007/11/11. I'm not Moriaty! I must say your methods are unorthodox but you get results. Our operator found the film in that rack you put her in. It was due to be shipped off to Switzerland. How did you find out?"

"Just a hunch, Sir."

"When she heard your distress signal she managed to burst out. Bad luck the door of the rack hit you. I'm moving headquarters by the way – while we were busy down here, somebody broke in to my office."

I said nothing. Suddenly I could see it all. The man I'd seen in L's office was not L at all, but Moriaty disguised as L. And he'd sent me after L who I'd thought was Moriaty disguised as L. It had been a close shave.

"What happened to our operator, Sir?"

"She's in the next room 007/11/11 – suffering from exposure. I must have a word with her about that bikini."

When L had gone, I crawled out of bed and made my way to the next room.

There are one thousand stories in the Rutherford Laboratory.
This has been another of them. There are now only nine hundred and ninety eight to go.

Who is Sylvia?

Five ladies, each accompanied by her daughter, visited a shop. Each of the ten bought as many feet of cloth as she paid farthings per foot. Each mother spent 8s.5¼d. more than her daughter.

Mrs. Robinson spent 6s.0d. more than Mrs. Evans, who only spent about a quarter of what Mrs Jones did, while Mrs. Smith spent most of all. Mrs. Brown bought 21 yards more than Bessie, one of the girls, while one of the other girls, Annie, bought 16 yards more than Mary and spent £3. 0s.8d. more than Emily.

The other girl's christian name was Sylvia. What was her surname ?

Principles of Management

(Extracts from a hand-out prepared by C. D. Ellis, Training and Research Manager of J. Lyons and Co. Ltd., for a recent Senior Management Conference at Durley Hall).

Never make a decision, it might be wrong. He who sits on the fence has his head higher.

If you keep a big heap of papers on your desk, you can pretend either that you aren't there or that you are very, very, busy.

Never have a typist, have a secretary. If you've an assistant, refer to him as 'my staff.'

Always argue hard about the unimportant things, it's far safer that way and besides, you don't need to know the subject. Never know the facts! If you do, you show you hold a very junior position.

Make a virtue of coming to work dead on time and you can then read the paper with a clear conscience.

Life is dead serious, don't laugh at it.

The Other Woman

"Hello, is that you Mary?.....*DARLING*, how nice to speak to you again. I haven't seen you since the wedding and I wanted to thank you for your present. Darling I didn't wake you up did I? .....Oh, *GOOD*. The pillow cases were *LOVELY*, in fact we're using them now – or at least I am – I'm here in bed all on my own.....No, John isn't here.....No darling, I'm not crying, really I'm not – I think I've suddenly got a cold. I feel *AWFUL* ringing you at this time of night, but I just *HAD* to speak to somebody.

Well you see, John's late again.....Yes, the same every day! You know he's working at the new High Energy thing here, well, he works the most *PECULIAR* hours. I just didn't *EXPECT* it darling that's all. It's ever since we were married – you know we didn't have a honeymoon because of John's work – well, I didn't *BREATH* it of course, but I was *TERRIBLY* disappointed. And now *THIS*. He's often at work all night, or so he *SAYS*. I mean, what am I to *DO*? Should I stay up all night myself and sleep with him during the day or *WHAT*? One's training doesn't equip one for this sort of thing.....You think it'll work out?..... You'll ring again in a day or two – you're an *ABSOLUTE ANGEL* darling, I don't know *WHAT* I'm going to do!"

"Mary, I feel so *WRETCHED*. He's so *CHANGED*.....Before we were married he was charming, so *ATTENTIVE* – now he's like a *BEAR*, he prowls round the house and *GROWLS* at me that his work's going badly. I said that it might help if he told me about it – I mean isn't that one of the *THINGS* about marriage – but he just *MUMBLED* that it was too complicated to explain. Then I suggested that he took up golf. Darling, I thought he was going to *HIT* me – I was *TERRIFIED*. He looked at me as if I were *STUPID* or something.

Today was the *ABSOLUTE LIMIT*. I'd *SLAVED* away all day to cook him his favourite meal and then he didn't come home. The whole thing's completely ruined. And he never even 'phoned. Well of *COURSE* I tried to ring him, but I can never get through to him. They say 'he's in but he's out' or they transfer me to another extension and then to another. I sort of go from 'phone to 'phone, apparently just missing him every time! They say 'he's just left the lab.' or 'he's just left the office'. If that were true Mary he must spend the *ENTIRE* day *SPRINTING* from building to building! I think they're covering up for him.

One day he'd just left the 'Parasitic Area'. What are they doing with *PARASITES* Mary? He says it isn't secret work and yet he never tells me what he *DOES*. It's *ABSOLUTELY BAFFLING*. A few days ago he didn't come home at all. The next morning he turned up looking like a *TRAMP* – said he'd slept at the Crew Room. Well I got the car out and drove for *MILES* and there isn't a pub of that name anywhere *NEAR* here, so I know he's lying to me. Do keep in touch Mary – it's such a help to confide in somebody."

"Mary I wonder if it's *ME*?.....Well I sit on my own in the evenings watching television and I wonder if those ads apply to me – do you think it's well, something *PERSONAL*. You would tell me darling if it was – I mean you *MUST*, I'm getting desperate.....I can't speak up darling because he's in the house – yes this is the latest development. He spends whole *DAYS* now, mooning about in his dressing gown. He says there's nothing he can do at work and he'd better keep out of it till his equipment's ready. And yet he *CAN'T* keep out Mary. He rings up several times a day to 'see how things are going' – and he's become so bad tempered. The *LANGUAGE* he uses to those *YOUNG* assistants.....I'll have to go – he's coming in."

"He's got another woman!.....No, no, don't tell me I must be mistaken Mary, I've had my suspicions for some time and now I *KNOW*..... I am calm darling, I'm *PERFECTLY CALM*. They've had a row – that's why he's at home so

much – but he's *INFATUATED* with her. I know because he keeps telephoning her when he thinks I'm not about. He tries to make out he's ringing the lab. but it's *OBVIOUS* darling, what's going on. Anyway he shouts so much one can't *HELP* overhearing.

Once he said, 'I was ready last night, why weren't you?' Another time he said, 'Are you alright for a long run tonight?' Where do they *GO* Mary? Out to the Crew Room again I suppose. I've found out her name – it's Nina. Well I've had enough – I'm leaving him at the end of the week! .....Why, *DIVORCE*, what else?.....*GROUNDS*, darling? Conjugal rights and that sort of thing. I'm at the end of my tether Mary. Look darling, would you be an *ANGEL* and let me stay with you for a few days? I'll ring again tomorrow and fix it up definitely."

"Oh hello Mary. How are you?.....You were worried about *ME*?.....*DID* I say I'd ring you yesterday? It must have slipped my mind, darling .....We have come to bed, but you didn't disturb us – not now – mmmmmmm I feel w-o-n-d-e-r-f-u-l .....*DIVORCE*? Oh that was all a *SILLY* misunderstanding. John was worried about his work but it's suddenly *ALL* come right! I must speak quietly, he's fallen asleep the *BEAST*. Poor darling, he's *ABSOLUTELY EXHAUSTED*. Well it seems they've made a wonderful *NEW* discovery at the lab. and John's going to be famous – isn't it *EXCITING*?.....New *PARTICLES* or something, but it's had the most *AMAZING* effect on him. He's *COMPLETELY* transformed, he's like he was before we were married only more so, if you see what I mean. I don't know exactly what it is they've discovered but I think they ought to put it on the market. He did tell me the name – 'intermediate boson' I think it was. Well *DARLING*, if this is the effect of the *INTERMEDIATE* one, I *SIMPLY* can't wait for the final one to come out."

Afternoon Out

Savernake Forest

Whenever the sun shines over a weekend, the Berkshire roads suddenly fill with 30m.p.h. motorists. Directed to this audience, we will select for a short article each month during the summer (loosely interpretated), one of the many natural beauty spots, places of historical interest, etc.....which are within easy reach of the Laboratory. We hope they may lead to many happy afternoons – provided you don't mind sharing them with 999 other Laboratory staff.

Savernake forest covers an area of about 4,000 acres about 15 miles west of Newbury. It is a magnificent relic of the wooded England of centuries ago. Although superficially untouched by human hand, it is in fact crossed by the main London-Bath road and also has a fine man-made road some four miles long, called the Grand Avenue, cutting through its centre. Connecting with the Grand Avenue are a multitude of minor forest roads which make almost the entire forest accessible by car.

Despite the existence of this tarmac network, the forest must look much the same now as it did to the Anglo-Norman kings who used to hunt there from their castle at nearby Marlborough. The usual game was stag, now extinct in the area, but for a time wild boar was specially imported for the hunt. This practice was stopped when it was discovered that the wild boars were tainting the local pigs. Can't trust these foreigners !

The Grand Avenue is lined by two towering rows of trees whose tops interlace in gothic-arches high overhead. An unusual feature of the forest is the absence of spikey fir trees or other conifers in any number; the varieties to be found are ancient oaks, ash, elm and beech. One incongruous monument stands feebly in contrast to the natural might of the trees – the Ailesbury Column, which commemorates the recovery of King George III from mental disorder in 1789.

It is rarely difficult to find an isolated clearing in the forest by following one of the minor forest roads, away from other visitors. In the sunshine, it is an idyllic, typically English, place for a picnic – the England represented in the tourist advertisements in America. (And if you go for a picnic don't forget to take your own supply of water). It can be highly recommended to courting couples, for even when the population density is high there are always the gigantic hollow trunks of some of the oak trees.

How to get there: Starting at the Rutherford Laboratory (which few of us are likely to do on a Sunday afternoon but we can all connect our routes accordingly) follow the A34 towards Newbury. Before reaching the town centre turn right at an island on to the A4 road travelling towards Bath. About 15 miles out, on the left, is Savernake. Just drive in and find yourself a clearing.

And it's all *FREE*.

Too Good to Miss

Extracts from the car-accident files of a well known London insurance company.

I left my Austin 7 outside, but when I came out later, to my amazement, there was an Austin 12.

Car had to turn sharper than was necessary owing to an invisible lorry.

I was scraping my nearside on the bank when the accident happened.

There was no damage done to the car as the gatepost will testify.

The witness gave his occupation as a gentleman, but it would be more correct to call him a garage proprietor.

One wheel went into the ditch. My foot jumped from brake to accelerator pedal, leapt across the road to the other side and jumped into the trunk of a tree.

A cow wandered into my car, I was afterwards informed that the cow was half-witted.

A bull was standing near and a fly must have tickled him because he gored my car.

She suddenly saw me, lost her head and we met.

I was taking a friend home and keeping two yards from each lamp post which were in a straight line. Unfortunately there was a bend in the road bringing the right hand lamp post in line with the other and of course I landed in a ditch.

I bumped into the lamp post which was obscured by human beings.

I bumped into a shop window and sustained injuries to my wife.

I heard a horn blow and was struck violently in the back. Evidently a lady was trying to pass me.

I misjudged a lady crossing the street.

Coming home I drove into the wrong house and collided with a tree I haven't got.

I blew my horn but it would not work as it was stolen.

A lamp post bumped into my car, damaging it in two places.

My car was stolen and I set up a human cry, but it has not been recovered.

I unfortunately ran over a pedestrian and the old gentleman was taken to hospital, much regretting the circumstances.

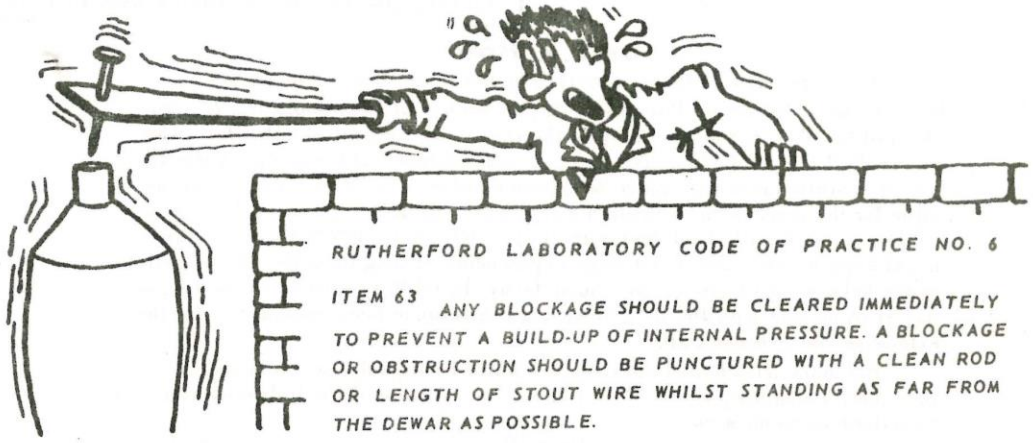
I thought the side window was down but it was up as I found out when I put my head through it.

I considered neither vehicle was to blame, but if either was to blame it was the other one.

I knocked over a man, he admitted it was his fault as he had been knocked down before.

I collided with a stationary tramcar coming in the opposite direction.

I collided with a stationary tree.



RUTHERFORD LABORATORY CODE OF PRACTICE NO. 6

ITEM 63 ANY BLOCKAGE SHOULD BE CLEARED IMMEDIATELY TO PREVENT A BUILD-UP OF INTERNAL PRESSURE. A BLOCKAGE OR OBSTRUCTION SHOULD BE PUNCTURED WITH A CLEAN ROD OR LENGTH OF STOUT WIRE WHILST STANDING AS FAR FROM THE DEWAR AS POSSIBLE.

Personnel News

Suggestion Awards

At the sixteenth meeting of the Suggestions Committee on Wednesday, 18th March, suggestions No.241 to 287 were considered and awards were made to the following:-

£20 to E. Kirby in respect of an ingenious and practicable proposal for adaptors for "Belling Lee" plugs, which has been successfully adopted.

£5 to D.A. Hutchings as an interim award pending a further assessment of the actual saving made by implementing an idea for a Thermoswitch Cover.

£2 to R.F. Ward who proposed improvements to the Restaurant kitchen drainage system. This will probably be implemented.

£2 to A. Holcroft for a proposal for a jig for brazing molybdenum strips which has been adopted.

£2 to J.E. Vanstone whose suggestion for the fitting of safety glass in the windows of R.2 Messroom, although not completely original, was a timely reminder and will shortly be implemented.

£2 to J. Townsend who suggested improvements to the lighting near the steps between the rear of R.2 and R.3 which are to be adopted.

£2 to C.R. Gascoigne for a proposal for an angled tool grinding platform which will probably be adopted.

£2 to S.E. Nunn whose suggestion will not be fully implemented but an improvement in welding facilities in the Magnet Hall was envisaged.

£2 to A.G. Daw who prompted a complete check of all vehicle first-aid kits and the introduction of a system of more frequent replenishment of missing items.

£2 to R.Scher who proposed a modification to neutron badge holders which is to be adopted as it may prevent the loss of badges due to defective clips.

Encouragement Awards of £1 were made to:
C.C. Briscoe, E.G. Starr, J. Townsend, O.J. Webb and L. Richardson.

D.G.J. ROSE, Secretary.

Comings and Goings

M.V. Harlow joins P.L.A Nuclear Physics; F.J.P. Rice joins Theoretical Studies.

A.J.K. Lubbock, D.J. Cumberbirch, W.H. Dormer, B.T. Lancelott and S. Lewis join Nimrod Machine Engineering.

Miss A.C. Rimmer and Miss J.L. Dawson join Administration; Miss V.A. Ramsey joins the Atlas Laboratory.

The following college-based Dip. Tech. students have joined us:

Miss A.M. Hobson, J.M. Parker and A. Simpson join Nimrod Machine Physics; Miss M. Bishop joins Nimrod Machine Engineering.

K.B. Burchell joins Nimrod Beams Physics; R.L. Cox and P. O'Brien join Nimrod General Physics.

D.R. Good joins P.L.A Nuclear Physics; S.G. Fidler joins Variable Energy Cyclotron.

T. Gover joins the Atlas Laboratory.

A.D. Martin, J.B. Mucklow, Mrs. S.A. Buck, R.G. Cooper, J.S. Brayshaw, L.M. Goward, R.W. Battersby, R.W.G. Bignell, W. Broadley and P.C. Jones have left us.

Congratulations to —

Bob Hilborne, Accounts, and his wife Jackie on the birth of a daughter, Joanne, on 17th April.

Administration Division Spring Dance

On Friday 8th May in the Restaurant
Dancing 9.00 p.m. to 1.00 a.m.

Licensed Bar	Chicken and Salad Buffet	Dress Informal

Some transport from:
Abingdon, Wallingford, Wantage and Didcot
Tickets 10s.0d. each available from L.A.Os.

Dr. J.R. Holt

Among the new Fellows recently elected to the Royal Society is Dr. J.R. Holt, Reader in Physics in the University of Liverpool, who is also Head of the Magnet Design Group in the Daresbury Laboratory. Dr. Holt, who has made distinguished contributions to both nuclear and elementary particle physics, started research under Sir James Chadwick in 1938. He was responsible for the early work on deutron stripping reactions on the small Liverpool cyclotron and later helped design the large 400 MeV cyclotron there. On this accelerator he has carried out many experiments, among them the determination of the helicity of electrons from muon decay. In 1960, he started the design of the NINA magnet with Dr. H.C. Newns, and has since been responsible for the extensive model magnet studies.

His many friends and colleagues both in Liverpool University and in the Daresbury Laboratory are delighted at this recognition of Dr. Holt's outstanding contributions to physics.

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