21st Issue

ORBIT

March 1964

The Journal of the Rutherford High Energy Laboratory

News from the North

The Daresbury Nuclear Physics Laboratory

D J Kinnersley

Not even the long-range weather forecasters could have told us that, if we had to start building our 4 GeV electron synchrotron, NINA, in the winter, this would be the perfect winter for it. It took from April till October to agree terms with owners and tenants for access to the site but with hardly any rain and little frost since the end of November, we can now report that the main excavation and piling are complete. Work is going well on the concreting for the base of the magnet tunnel and on foundations for the ancillary buildings.

This is remarkable progress for four months' winter work. It is, however, no less than we needed because, despite the delayed start with building, we have largely held to the original programme for the plant. Thus the completion dates for buildings in the last months of this year have become rather a tight fit with vital dates in the plant programme. We are, therefore, all the more pleased to see the job going so well in the hands of the Authority's Engineering Group and the contractors.

On the plant side, several contracts have been settled since Christmas which are not only large in terms of money but also of critical importance for the success of the project. It was decided that Siemens should make the magnet blocks, for which the steel comes from the United States. One encouraging factor has been that, for several of the very costly items, tender prices (at least from the successful firms) have turned out to be fairly close to the funds provided in our estimate.

Since Christmas, the biggest step forward of all has been, of course, actually getting established as a working unit on the Daresbury site. We were grateful to the Nuclear Physics Research Laboratory of Liverpool University for the space they managed to find for us as our numbers grew in the second half of 1963, but inevitably conditions were difficult. The move to our temporary offices at Daresbury very quickly gave us the feeling of having the unified base we had previously lacked. The groups still working in Liverpool and at the Rutherford Laboratory will be joining us shortly.

The actual move at the end of January went well, again with favourable weather proving an advantage. Travel to the site is so far proving less difficult than we expected and it is now helped by the lighter evenings. One slight disadvantage is a shortage of attractive inns for lunch-time refreshment, but the few good ones were rapidly identified. Also, a temporary canteen is to open next week and thoughts are turning to possible recreations on the site for summer lunch-times.

The site itself is most attractive, having rising ground capped by woods to the rear and the Bridgewater Canal forming the opposite boundary. We hope to take advantage of the Canal bank and the fairly wide views to the south and west beyond when we fix the site for the permanent Restaurant. Rumour has it that a case is to be made to the Treasury for purchase of a motor launch to recover stray particles that get lost in the canal, but even if this is unsuccessful (or untrue) the Canal should certainly prove a distinctive feature of the site.

Our numbers have, of course, increased since we arrived, now that we have the beginnings of a fully established Laboratory. At the time of writing, there are forty-two staff on the site and when the groups from the Rutherford Laboratory and Liverpool have joined us, the total will be up to 60 or more. The rapid growth of staff numbers is always liable to bring some problems, but so far the most striking result has been to see how well the staff coming from various places – Liverpool University, The Rutherford Laboratory, the A.E.A. and outside – are coming together to be, quite distinctively, the staff of the Daresbury Laboratory.

We will send further progress reports to ORBIT as work proceeds, but the next four months can hardly bring such changes as the period since October.

'The hunting of the Quark'
Sunday Times, 1 March
Describing some work at
CERN –

'Each physicist, with a girl beside him, spends two hours a day scanning photographs and gets through 400 or 500.'

Professor P.T. Mathews
writing in the New Scientist
on the discovery of the Ω^-

'High energy physicists are walking around with a slightly hysterical look, as though they are actually witnessing the apple landing on Newton's head.'

An extract from a piece of
typing done for Radiation
Protection Group –

'In order to study induced activities associated with this work, the group has built specialised low radiation background courting apparatus, housed in a quiet part of the site, and can offer this service to other workers.'

Nimrod Division Notice No.2

'The five-storey extension to Building R 2 . . . . . has provision for four beds and a shower on the top floor.'

A 7 YEAR OLD, POINTING TO THE RUTHERFORD LABORATORY STICKER ON THE WINDOW OF HIS FATHER'S CAR WHISPERED TO HIS FRIEND, 'THAT MEANS MY DAD'S A MEMBER OF THE SECRET CIRCUS.'

The Accelerator World

The CERN proton synchrotron has recently operated continuously for three weeks (instead of its usual run of two weeks). Nine experiments are in various stages of operation around the machine which is the highest number yet achieved. During 1963 some 2½ million bubble chamber photographs (each consisting of three stereoscopic views of the same event) were obtained at CERN, which brings the total to over 6 million since bubble chamber work began in 1960.

The State University of Groningen in Holland has placed an order with Philips for an isochronous cyclotron which will be the biggest ever built by the Philips Company. It will be possible to control the energy of the accelerated particles over a wide range, for example protons will be accelerated to energies from 10 to 50 MeV. This is a similar energy range to that of the Variable Energy Cyclotron being built for AERE.

A CERN Press Release talking about the proposals for the future European accelerator programme says, 'It is estimated that by 1977, the science of fundamental nuclear physics would provide work for some 2500 physicists and 1500 engineers over the whole of Europe. The annual cost would be some 1600 million Swiss francs (1 SF ≡ 1s.8d.) but this would still be only 0.072% of Europe's gross national product. Put another way, the monthly cost to each family in Europe would be comparable to the price of a few pints of beer.'

First Operation of DESY

At the end of February, news reached the Laboratory that the electron synchrotron being built at Hamburg (DESY – Deutsches Elektronen Synchrotron) had achieved an energy of 5 GeV with 5.10^{11} particles per pulse for the first time. The synchrotron is a strong focusing type (FODO) with 48 sectors (different apertures in F and D sectors) and 16 accelerating cavities. A linear injector supplies 125 mA of electrons at 40 MeV. The pulse rate is 50/sec. and the design energy is 7.5 GeV. Their first beams were predicted for mid-1964.

The German machine joins the Cambridge Electron Accelerator built by the Massachusetts Institute of Technology and Harvard University which first operated at 6 GeV in 1962. Other electron machines in this range under construction are a 6 GeV synchrotron at Yerevan in Soviet Armenia and our own NINA a 4 GeV synchrotron at Daresbury in Cheshire.

CERN Meeting

An informal meeting on filmless spark chamber techniques and associated computer use was held at CERN from 3 – 6 March. About 200 physicists, including several from the Rutherford Laboratory, met to discuss techniques both currently employed in nuclear physics experiments and those in the development stage.

Of all the types of spark chamber described, the acoustic chamber appeared to be furthest developed. At the Rutherford Laboratory, three groups have incorporated this type of chamber in current experiments on NIMROD. It was shown at the meeting that the main disadvantages of the acoustic chamber, (low repetition rate and difficulty in resolving multiple sparks) can be overcome by the vidicon optical system and the wire chamber. One of the most interesting papers was by Giannelli (Bari, Italy) describing a development of the wire chamber in which only a single plane of wires was necessary to locate the positions of multiple sparks. The wires were of specially chosen material which exhibits magnetostriction and this property was used in the new technique. Also of interest was the current distribution spark chamber developed by Charpak (CERN).

The most spectacular description of the use of an on-line computer was given by Dr. S.J. Lindenbaum (Brookhaven, USA). He intends to use scintillation counters, rather than spark chambers, to study the scattering of elementary particles in liquid hydrogen and expects counting rates of about one million events per hour. A computer will plot the results continuously as the experiment runs. (This group's budget will be between $500,000 and $1000,000 per year).

G.Manning, E.Taylor and C.Whitehead described their acoustic spark chamber set-ups at NIMROD and there was at least one unofficial lecture by N.H. Lipman. Proceedings will be published in about two months time.

The Oxford Project

Construction of the large pressure vessel for the Oxford Electrostatic Generator has recently been completed by John Brown and Company (Clydebank) Limited. The vessel, which will house the large electrostatic generator, is located in the tower at the west end of the new building for the Department of Nuclear Physics at Oxford University.

Before manufacture began the steel plates were examined by ultrasonic techniques for non-metallic inclusions and lamination defects. X-ray examination of all welds followed assembly, using X-ray equipment up to 1,000kV which is capable of radiographing metal thicknesses up to 6 inches. After stress relief treatment samples were submitted to tensile and bending tests. Hydraulic pressure and vacuum tests were made on the finished vessel.

Fundamental Particles I

This first article on Fundamental Particles is an historical survey of the major events. No attempt is made at this stage to 'explain' the particles or detail their properties and interactions and it is hoped that those who may get lost when quantum numbers appear will share some of the atmosphere of our work from reading this survey.

The idea that all matter is built up from a few fundamental units has been with man for centuries. The oldest known record is in the writings of Democritus in 400 B.C. where the name atom, meaning 'indivisible' first appeared. Scientific evidence to support this idea was collected by the 19th Century chemists who, led by Dalton in 1803, compiled a list of the separate types of atom and when Mendeleef assembled the orderly array of the periodic table in 1869, it seemed as if one of man's first theories about nature had been proved very satisfactorily.

The Breakdown of the Atom

This orderly state of affairs was short-lived, for several physicists were engaged in investigating the nature of the cathode ray and the electron, e, was discovered. Thomson expressed the results of his experiments in 1897 as follows:- "We have in cathode rays, matter in a new state, a state in which the sub-division of matter is carried much further" and he ends with the then revolutionary conclusion, "atoms are not indivisible, for negatively charged particles can be torn from them by the action of electrical forces." Another revolution in thinking was the work of Planck who suggested, in 1901, that energy was not continuous but existed in discrete units; the unit was given the name 'quantum.'

The next big advance was the result of Rutherford's experiment in 1911. The negative electrons were assumed to be dotted about in a sphere of positive charge to give an electrically neutral atom. Rutherford fired a beam of alpha particles emitted by radioactive radium at the atoms in a gold foil. The alphas were quite energetic positively charged particles which were expected to plough through the spheres of positive charge with little deviation from their original paths. In fact, a small number were actually reflected back in the direction of their source. Rutherford's surprise at this observation can be judged from his remark, "It was as incredible as if you had fired a 15 inch shell at a piece of tissue paper and it had bounced back and hit you."

To explain the results of his experiment, he suggested that the atom consisted of a tiny concentrated core of positive charge, which reflected the alphas, and a cloud of electrons around it. This core was termed the nucleus and 'nuclear science' had begun.

Protons, neutrons and mesons

The nature of the electron cloud was clarified early in the century and the focus of attention became the nucleus. The positive particle in the nucleus was separately identified and called the proton, p. Its mass was measured to be 1840 times that of the electron.

Then in 1932 Chadwick demonstrated experimentally the existence of a particle postulated by Rutherford some twelve years earlier. This was called the neutron, n, carrying no charge and being almost equal in mass to the proton. The neutrons share the nucleus with the protons in approximately equal numbers and both inhabitants of the nucleus were given the name 'nucleons.'

A little earlier in 1926, Schrödinger developed the mathematical equation, one of the corner-stones of quantum mechanics, which is still used to tackle the problems of particle behaviour.

But Rutherford's theory indicated that many positive charges are packed within a diameter of about a millionth of a millionth of a centimetre. The coulomb force (two positive charges or two negative charges repel one another and the force of repulsion increases the closer the particles come together) tending to push the protons apart when they are brought so close is enormous and it was obvious that some powerful force must exist within the nucleus to hold it together.

In 1934, Yukawa, a Japanese theoretical physicist, published his theory of this nuclear binding force. He used Einstein's $E = mc^2$ relationship to explain the energy which binds the nucleons together in terms of a particle which is exchanged between them. The mass of this particle was calculated as some 200 times that of the electron and it was later given the name 'meson'. After Yukawa's theory was published, scientists searched for experimental evidence of the meson and in 1936 Anderson and Neddermeyer recognised a particle from tracks on cloud chamber photographs of cosmic rays which was thought to be the Yukawa particle.

Antiparticles and Decay

The concept of antiparticles originated in Dirac's theory of the electron in 1934. Dirac developed an equation to represent the motion of a free electron or proton and noted that both a positive and a negative solution existed. The negative solution implied particles of negative energy - 'antiparticles.' For every particle there exists an antiparticle. Anderson and Blacket had actually already detected an electron - antielectron (called a positron) pair in 1932. The antiproton had to wait until 1955 to be identified on the Bevatron accelerator in the USA.

Electrons were observed to be emitted from a radioactive nucleus and their origin was explained as the breakdown or 'decay' of a neutron into a proton and an electron. (Almost all particles are now known to decay into lesser particles). Since the energy released in the decay must always be the same, the fact that the electrons were emitted with a range of energies posed a problem. Pauli and Fermi suggested that a new particle, the neutrino, ν, could carry off some of the energy so that the energy of the electron plus that of the neutrino is always the same. The neutrino has no mass and no charge which made detection difficult and it was 1956 before a conclusive experiment to demonstrate its existence was carried out by Cowan and Reines.

This was the state of affairs just before the second world war. The separate parts of the atom – electron, proton and neutron – had been identified and the existence of the meson, which carries the energy of the nuclear field, apparently experimentally verified. Antiparticles were known to exist and the neutrino was postulated. If we add the 'quantum' we have a small group of fundamental units. We seemed to be in a much more satisfying position than even the chemists with their many types of atom.

Cosmic Rays

After the war, investigation of cosmic rays became more intense. Primary cosmic rays are known to consist mainly of protons with small percentages of alpha particles and other heavier nuclei sometimes with fantastically high energies (greater than a million GeV), showering into the atmosphere from outer space. Until the 1950's, they provided the major source of high energy particles. The 'creation' of new particles can only occur when the necessary energy is available for conversion into mass in accordance with Einstein's $E = mc^2$ relationship, which explains the concentration of interest on cosmic rays. They were investigated using cloud chambers and later photographic emulsions in both of which they leave tracks which can be interpreted to provide a great deal of information.

Around 1947 it was realised that the meson detected by Anderson was not the one which fitted with Yukawa's theory. Powell, working at Bristol on cosmic rays, identified the true Yukawa meson and called it the pi meson, π, (273 times the mass of the electron), the Anderson meson became known as the mu meson, μ, (207 times the mass of the electron).

Further unexpected particles were discovered following the work of Rochester and Butler at Manchester who found two neutral particles, (later called the K meson, with a mass around 1000 electron masses, and the hyperon, with a mass greater than that of the proton) in cloud chamber photographs of cosmic rays. This was the first indication of a complex pattern of new particles heavier than the proton, which have now been identified.

High Energy Accelerators

Cosmic rays are not a controllable source of high energy particles and the incidence of the heavy particles in particular is very rare. Thousands of photographs may reveal the interesting particles only once, thus the possibility of producing the particles virtually to order in the laboratory is invaluable. The development of the techniques to build high energy machines was a great breakthrough for the nuclear physicists. They have provided a great mass of data on the elementary particles and their interactions and the spearhead of the attack on the fundamental structure of matter has moved to the accelerator laboratories.

Recent Developments

By the late 1950's a table containing some thirty particles had been assembled with additional particle names like xi (Ξ), sigma (Σ) and lambda (Λ).

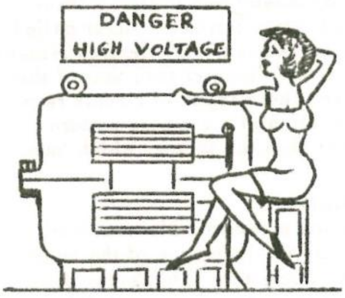
In 1960 another, even bigger population explosion in the fundamental particle family began when it was found that the thirty particles represent only the 'unexcited states' of matter and that a great spectrum of particles with higher masses exists. These new particles are known as resonances and they 'live' for very short times (less than a millionth of a millionth of a millionth of a second) before 'decaying' into other particles. The list of particles has been extended to about a hundred.

But at last some order is becoming apparent in the observations. The experimental data is beginning to fall into striking and partly predictable patterns.

In future articles we shall sort out the particles into different classes, distinguish the ways in which they interact and assign them 'quantum numbers' which identify them and dictate their behaviour.

The Week of the Opening Ceremony

The week 20–24 April will be largely taken up by events connected with the official opening of the Rutherford Laboratory.

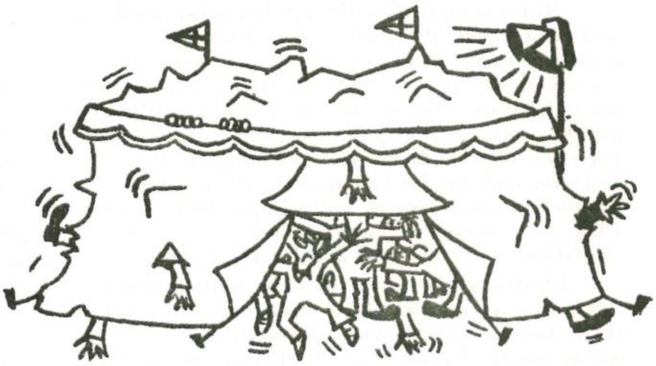


On Tuesday, 21 April Press photographers will be let loose on the site and every pretty girl at the Laboratory will be in serious danger of finding herself draped around a quadrupole focusing magnet on the front page of the Daily Mirror.

Wednesday 22 April will be the day of the Press correspondents visit. (Apparently Press correspondents are 'a different breed of men' from Press photographers and people with experience of this type of publicity work, keep them well segregated!) 80 to 100 people representing newspapers and the technical press are expected to invade the site on this day. After an introductory address from Dr. Pickavance the visitors will tour the Laboratory in parties and the day will end with a Press Conference.

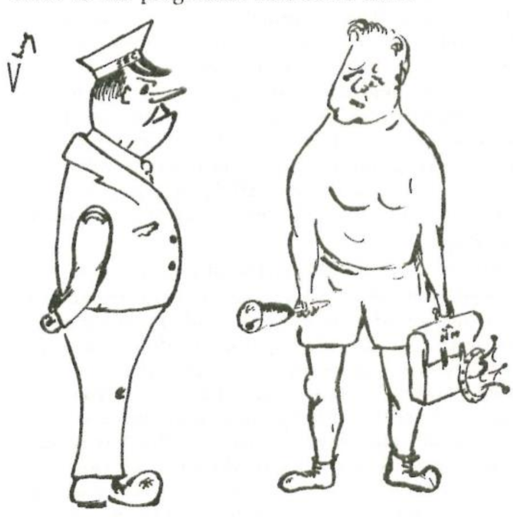
On Thursday a rehearsal of the switching-on of Nimrod ceremony will take place in an effort to ensure that all will go smoothly on the following day. (And, strictly between ourselves, if the pressing of the button should disasterously coincide with the explosion of some major component, who is to know that some quick thinking gentleman behind the scenes hasn't quickly swopped the signal reaching the official platform to a previously prepared indication of successful operation).

Friday is the big day itself when the Rt. Hon. Quintin Hogg, M.P., who by then will be the Minister of State for Education and Science, will perform the significant act. About 250 guests will be present and probably press men (a smaller number than earlier in the week) with possibly T.V. coverage as well. The film of the Laboratory, which is now near completion, will be shown to the guests in the morning. The inaugural ceremony will take place at 2.15 p.m. preceded by lunch at which Mr. Hogg, Lord Bridges (Chairman of the National Institute), the Director and others will speak. The speeches will be relayed to a large marquee where a free lunch will be served to Laboratory staff, University visitors and M.R.C. staff.



On Saturday there will be a general Open Day for the staff of the Laboratory, their families and friends. All the exhibits which are being prepared for the Press visit etc. will still be on display and the film of the Laboratory and the film of the making of the Nimrod Vacuum Vessels will be shown throughout the day.

The detailed arrangements are subject to change between now and the week of the Opening Ceremony but the general pattern of events will be close to the programme laid down here.



MR. WHO? COME TO OPEN WHAT?

EDITORIAL

The week of the Nimrod Opening Ceremony is the biggest exercise in public relations that the Rutherford Laboratory has ever undertaken. In fact up to the present the Laboratory has hardly concerned itself with public relations. In order to make this week a success a good deal of effort will be called for from many parts of the Laboratory and especially from some branches of the Administration. Also there will be some inconvenience caused to scientific and engineering groups as they are called on to stop their normal work to prepare exhibits and to throw open their labs. to the invasion of the Press and many other visitors. Why is this exercise so important?

If you have ever been asked , 'Where do you work?', one part of the answer will be obvious. Anyone whose reply 'The Rutherford High Energy Laboratory' isn't met by 'I beg your pardon' or more colloquially 'The what?' is obviously speaking to someone extraordinarily well informed or extraordinarily polite. And if you should add Chilton as the address, the blank faces indicate minds scouring everywhere north of Lands End. But mention that you are next door to the Atomic Energy Research Establishment at Harwell and the faces light up with knowledge.

Harwell is 'a household word' but 99% of the country's population have never even heard of the Rutherford Laboratory. And yet our Laboratory houses, in its accelerators, some of the finest scientific and technical achievements in the country and we are engaged on research which is at the very forefront of science today.

Even from a narrow self interested point of view it is to our advantage to get our Laboratory and our work more widely known. The factors coming to bear on the political decisions which assign capital and effort to particular projects are complex and the decision can hardly ever be based on the purely scientific case (and it is probably right that this should be so). To view the matter cynically what political party in election year would slip an extra million to the Rutherford Laboratory when the impact of its bounty would be a hundred times as great if that million went to Jodrell Bank.

Let us imagine a scene in an ante room of the House of Commons

'..... married Lady Margaret Hall you will remember. Oh, hello George – take a pew.'

'I'm sorry to trouble you Humphrey but I've got the proposed budgets for the research establishments here and I thought we'd better take a look at them before the meeting this afternoon.'

'That's alright, fire ahead. You don't mind do you Harold?'

'Well, I'll try to run through them as quickly as I can. Now let's see. Ah, yes, here we are. Mmm... Yes, the Atomic Energy Research Establishment at Harwell would like an extra couple of million for something or other. Some new work they're thinking of doing – need new buildings,equipment, staff and so on ..... Cigarette Humphrey?'

'Thanks. Harwell, Oh yes. Fine place that. Reactors, Sir John Cockroft, Zeta ..... wonderful work they are doing. Must press that item through ye know as fast as we can. Got to keep our key men content these days or the Americans will be in like a shot.'

'Fine. Well I'll tick that off. Now there's something here from the Rutherford High Energy Laboratory. They'd like £200,000 to keep their machine running in normal hours during the winter.'

'The Rutherford what?'

'High Energy Laboratory. Elementary particle research and so on.'

'Hmm... What's this machine they want to keep running?'

'It's a proton synchrotron, I understand ..... Er..... they need it to carry out their experiments..'

'Now look George. They can start the damn thing again in summer can't they. Do they think we are made of money or something.'

'I believe they felt that £200,000 wouldn't break .....'

'Oh now, now, now. We can't have this nibbling away at our resources. Got to keep a firm grip on things. Some of these places will just have to tighten their belts..... Pass the claret George, would you .....'

To take a less self interested view, what is the Laboratory for if not to attempt to make some contribution to the scientific knowledge of the whole world? To do this, there must be communication across the four foot high wire fence that surrounds the site. And this communication should not be exclusively to other similar establishments – that is hardly the whole world – but should add to that rather nebulous entity called the scientific culture of our society.

After all our Laboratory uses the taxpayer to the extent of some seven million pounds a year. Can he not, in return, expect to know and perhaps benefit a little from some information about what goes on at the Laboratory. Only defence establishments, which breed on secrecy, can claim immunity from the right of the general public to know something about where and why their money is being spent. (If one of the Press men who will shortly invade the site were writing this Editorial they would present this argument in a much more forceful way).

And who knows but that after the clamour of

EDITORIAL cont'd

the week of our Opening Ceremony, a casual mention in a crowded pub that you work at the Rutherford Laboratory will halt the steady consumption of pints and bring the whole bar into an attitude of mental genuflection.

Letters to the Editor

(Pseudonyms are accepted provided the authors name is known to the Editor).

EDITOR : B. Southworth,
National Institute for Research in Nuclear Science,
Room 2.2, Building R 1,
Rutherford High Energy Laboratory,
Chilton, Didcot, Berks.

Sir,

In his evening talk on 5 March, John Maddox suggested that, today, the motivation for publishing scientific papers was baser than in former times, when the object was primarily dissemination of knowledge. A study of history however suggests that at least one of the less 'pure' motivations for publication, that of establishing personal priority for a discovery, was quite as powerful as it is now.

An interesting example is the announcement by Huyghens of his discovery of Saturn's rings. The odd and variable shape of Saturn as seen by the telescopes of the time was a puzzle and, in 1656, Huyghens hit on the idea that the planet was surrounded by a ring. He was anxious to claim the discovery, but did not want to be thought foolish should the idea turn out to be wrong. Accordingly, he published a tract, containing the following "proposition"

'aaaaaaa ccccc d eeeee g h iiiiiii llll mm nnnnnnnnn oooo pp q rr s ttttt uuuuu'

Three years later, when he was certain and no other astronomer had come out with the same idea, he showed that the letters could be formed into the statement : "Annulo cingitur, tenui, plano, nusquam, converente, ad eclipticam inclinato," which may be translated : "The planet is surrounded by a slender flat ring, everywhere distinct from its surface, and inclined to the ecliptic."

This technique might be recommended to anyone who, faced with an inexplicable tangle of bubble chamber tracks, or a wild and unexpected counting rate, thinks that he may have found a new particle!

aa dd h i j l nn oo s v w.

Sir,

Brookhaven's contribution to Nuclear Science Ω^-.

The Rutherford Laboratory's contribution to Nuclear Science $-t$.

N.O. TROLLEY.

The Supervisor's Prayer

Dear Lord, help me to become the kind of supervisor my management would like me to be. Give me that mysterious something which will enable me at all times to explain rules and procedures to my workmates, even when they have not been explained to me.

Give me the love that passeth all understanding, so that I may keep my patience and temper with the uninterested, and lead the recalcitrant and obstinate into the paths of righteousness by my own good example.

Instil into my inner being the tranquility and peace of mind that I may no longer think – what has the boss got that I have not, and how did he get it?

Teach me to smile if it kills me and make me a better leader by helping me to develop greater qualities of understanding, tolerance, wisdom, perspective, equanimity, mind-reading and second sight.

And when, dear Lord, thou has helped me to achieve the high pinnacle my management has prescribed for me, and when I have become a paragon of all supervisory virtues in this mortal world, dear Lord, move over.

The Duty Officer

The Duty Officer is sitting in a deck chair in the patio of R 2. He is dressed in fresh white flannels, a Guards blazer, white shirt and cravat and two-tone shoes. The sharp tang of after-shave lotion surrounds him. He is smoking a hand-made cigarette in a long gold holder and to his left hand is a glass topped table, on which stands an ash tray, a platinum lighter, a silver thermos flask and a tall glass of iced lager. At a discreet distance behind him sits his secretary. She works at a stainless steel and teak desk and her elegant fingers flicker over the keys of a neat matt grey electric typewriter, with muted staccato taps.

"I say, Suzie! Do a memo to Site Services would you m'dear? That fountain is too noisy dammit..... feller can't concentrate..... Get them to see to it ..... and bring me the paper, there's a good gel."

She stands up, puts on her sun glasses, smooths down the skirt of her white shirt-waister and carries over the Times on a silver tray, her white high heeled court shoes clacking on the marble floor. The Duty Officer opens the paper at the crossword.

A light flashes on Suzie's desk and she picks up the turquoise blue telephone receiver. There is a brief murmured conversation and then she comes nervously towards the deck chair.

"Excuse me Sir."

"Well what is it? Can't you see I'm busy!"

"I'm terribly sorry to disturb you Sir, but there's a request from the Quark I beam line."

"Dash it all! When will those fellers learn that we keep Gentlemen's hours up here – never do anythin' till after ten!"

"They send their apologies Sir, but I believe they have been waiting all night to have their target flipped."

"Well where are the crew dammit?"

"Quark I say there's no reply from the Main Control Room. I think the crew are having their swim, Sir."

"Swimmin'? I thought it was billiards."

"Only in wet weather Sir."

"Do you mean the Control Room is unmanned? I really must speak to those chaps, damn bad form what? What happened to that extension lead we had made up to control the beam from the billiard room, couldn't they have taken that with them?"

"I believe it's unserviceable, Sir."

"Place is goin' to the dogs! I suppose I shall have to deal with it, white man's burden, what?"

He stands up, adjusts his cravat, shoots his cuffs and pulls on a pair of white kid gloves. Suzie brushes his blazer with a pearl handled clothes brush and hands him an immaculately rolled umbrella. He folds the Times and puts it under his left arm, his hand in the pocket of his blazer. Swinging the umbrella in his right hand, he strolls to the Control Room, whistling 'Colonel Bogey'.

Suzie opens the doors for him, then stands quietly behind him, sensing his uncertainty, as he thoughtfully looks at the control panels.

"It was the Quark I target Sir."

"Yes, yes, I remember that, gel."

His eyes come to rest on a panel with several pulsing red lights. He stares at it intently for a while, then slowly and deliberately reaches out and pushes a button with the tip of his umbrella. He leans nonchalantly on the control desk and folds the paper back to his crossword. Instantly the intercom. sounds.

"Hello. Main Control Room P I here. You seem to have started the extracted proton beam. We're not actually complaining of course, in fact we're absolutely delighted with it, but perhaps we could, if you'll forgive us, draw your attention to the schedule. You are a teeny weeny bit early with our beam."

"Schedule? Is that the paper I use to light my cigars with Suzie?"

THE DUTY OFFICER - cont'd.

"Well yes Sir, but I have a copy. Their beam isn't scheduled for several months yet."

"Good heavens. Some people are never satisfied! Which button did I press?"

"I think it was this one Sir." She points hopefully to the middle of the complicated control panel.

"Let's try this one next to it then."

He reaches out again with his umbrella and his eyes drop again to the crossword, forgetting that he is still pressing the button with the tip of the umbrella. The intercom. sounds urgently.

"A message from all beam lines, Sir. Their magnets have gone out of control and caught fire. What shall I say Sir?"

"Mmm, let me see ..... five letter word beginning with 'b'..... Pardon, did you say something Suzie?"

"You're still pressing that button, Sir."

"Great Scott so I am! Better sort that out."

He presses several buttons at random on various panels. Several telephones ring at once and Suzie runs about trying to answer them. Her hair is becoming dishevelled.

"A message from the Alternator House Sir. The two alternators have somehow been connected in opposition and have blown up."

"Mmm.... Ten down – I'm alright something..... Four letter word beginning with 'J'....." More bells ring and he looks up in annoyance. "Feller can't concentrate anywhere these days – signal to the C.O. about that infernal row!"

At this moment the crew return. They are all wearing swimming trunks and are towelling themselves vigorously.

"We came back early Sir. There's smoke and flames shooting out of the Convertor House and fire engines everywhere."

"Now look here you chaps – this is a damn poor show – I've been in here for over ten minutes – ten minutes! – single handed – even had to press those button things m'self! You let me down and you let yourselves down. Damn poor show. Now buck up!"

They stand to attention in a line, dripping water onto the floor. He slowly walks down the line, his nostrils flaring. The Senior Technician salutes.

The Duty Officer walks stiffly out to the patio, with Suzie behind, straightening her hair.

"That's what a Duty Officer's for m'dear..... to deal with emergencies."

Personnel News

Congratulations to–

Nimrod, the European Brown Bear at Whipsnade Zoo who, on the 1st January gave birth to triplets – 2 males and 1 female. Mother and cubs are all doing well and the cubs can now be seen in the Children's Zoo. They have been named Cilla, Ringo, and George!

(The suggestion in a letter some months ago that the Daresbury Laboratory have got the sex of their synchrotron NINA wrong, seems to have backfired.)

Royal Humane Society Award

Derek Gregson received the Royal Humane Society Resuscitation Award at Wantage Magistrates Court on Wednesday, 4 March. The Chairman, Mr. W.F. Wood of AERE, presented the Certificate which reads –

'It was resolved unanimously that the humanity, promptitude and skill shown by Derek Bradley Gregson in having, on the 1st August 1963, restored to life a man entitles him to the Resuscitation Certificate of the Society which is hereby awarded.'

Comings and Goings

B.E. Belcher joins Nimrod General Physics; T.J. Keaney joins Nimrod Machine Engineering.

Mrs. J. Wells, Mrs. M.C. Wilson and D.W. Livingstone join General Administration.

P.J. Horton joins PLA Engineering; A.L. Fenton joins High Energy Physics Electronics.

Mrs. S.M. Clare, C.J. Moody, J.H. Reynolds, W.O.L. Foster, A.J. McCormack and R. Barnard have left us.

Rutherford Laboratory Record Society

It is proposed to form a Record Society at the Laboratory to provide an opportunity to hear and discuss recorded music in an informal atmosphere during lunchtime.

Would those interested please contact R.C. Hazell Ext.6116 or T.W. Harper Ext.6117.