# RBIT

Christmas and New Year Issue
December 1963

The Journal of the Rutherford High Energy Laboratory

## Christmas Message from the Director

A year ago I forecast that 1963 would see the operation of Nimrod, and the beginning of the transition from construction to research in the main department of the Laboratory's activities. This came about rather earlier than I had expected, and in great style. It was, let us admit, a great relief to all concerned when it could be seen that the thing actually worked even when considerably maladjusted.

One event which I did not predict was the financial problem which arose during the summer. This was very uncomfortable, but prompt action and the co-operation of the staff enabled us to come through in good order.

We now have an excellent initial experimental programme for Nimrod which will occupy a large part of 1964. In addition we hope to be able to mount bubble chamber experiments during the year. Altogether, we are joined by staff and students of 12 university physics departments in these preparations to use Nimrod, which have been pursued very vigorously.

The P.L.A. has also progressed very well during 1963. The annual shut-down for overhauls, improvement and change-over of experimental equipment was completed on schedule, and the machine has run with even better reliability since then. The increasing interest in Nimrod has not reduced the numbers or the enthusiasm of the research workers using the P.L.A., which continues to be a very important part of the Laboratory and an excellent source of Ph.D (and D.Phil.) thesis material.

Once again, then, we are completing a hard but successful year's work and can look forward to our Christmas break feeling that we have earned it. I wish all my colleagues at the Laboratory and in the associated universities and other organisations, and their families, a happy Christmas and a prosperous New Year.

T. G. PICKAVANCE

# The Case for the European Programme

On 25th June 1963, Professor Weisskopf, Director General of CERN, spoke at the Institute of Physics of the University of Bonn. Members of the German Government were present and Professor Weisskopf directed his speech to encouraging them to support the European High Energy Physics programme. As a comment on the section (published in last month's ORBIT) of the Annual Report of the Advisory Council on Scientific Policy dealing with this programme, we are reproducing part of the speech here. Some figures relevant to the U.K. expenditure have been inserted in brackets by the Editor. A few copies of the entire speech are available in the Editor's Office, Room 2.2, R 1, X 458.

Physicists in all countries are currently discussing what accelerators should be constructed in the future. From the technical point of view, there seems to be no immediate limit to the energy one could reach. The largest machines today are the 33 GeV Brookhaven accelerator and the 28 GeV CERN machine; a Russian machine of 70 GeV is being built and will probably be ready in two or three years. European physicists, after a very full discussion, have proposed that a machine of about 300 GeV be constructed. Such a machine – which would be about 10 times larger than our present one – would put us in a position to study better many of the problems in nuclear physics and to produce the phenomena more completely than we can with our present equipment.

Moreover, the European physicists have proposed to build an extension to the CERN machine, which would take the form of the so-called storage rings. These would really be a second machine, placed beside the existing one and into which the beam would be directed and stored. The beam would be injected in two directions, once round one way and the next time round the other way; one would then be able at chosen places on these rings to let the two beams collide and thus not only to double the energy as one might believe at first, but to increase it by a factor of about 100, as people who understand the theory of relativity realize. That is the point of such storage rings. Of course, the number of lucky hits one obtains when two beams collide is not very high, because the beams are highly rarefied matter, but one would nevertheless have the possibility of making at least a few experiments at a very high energy. There are many other advantages connected with the storage rings, they would, amongst other things, increase about five fold the experimental facilities of CERN, and it should be remembered that we already suffer too much from lack of space and time to give all the physicists interested, sufficient machine time and facilities.

The proposal of the European physicists thus consists of a 300 GeV machine and of these storage rings. Proposals of a similar kind are naturally made in America and in Russia. The American programme, which is talked about today, is much more ambitious than the European proposals : one speaks of a 600-800 GeV machine and also of machines of lower energies. If these proposals are put into effect, a tremendous step forward will have been made in this field of physics which is the most fundamental of all.

It is necessary at this stage to consider the other side of this problem, for is there any real sense in building always larger machines ? There is a philosophical and a practical side to the problem. The philosophical part of this question is this : When will one really come to an end ? We are now in the third phase of atomic physics and there possibly will again be particles of particles, so that one will build accelerators of yet higher energies to investigate the structure of these particles of particles. Every time it costs more money; when do we come to the end ? This is a very hard question to answer.

Perhaps one should come to the end when the field ceases to be interesting. If we are very lucky and if we are clever, the discoveries made with the present machines and with the next generation of machines may perhaps enable us to find a basic law of nature to explain the phenomena, and then one will probably require another generation of accelerators in order to prove such a conclusion. Then, of course, if one understands everything, the field will lose its interest. On the other hand, one may never be able to understand it; in this case, two possibilities arise: either one will continue to find new phenomena which are somehow connected with nature and the history of nature and with our place in the universe – this would be interesting and we shall then probably be prepared to go further and further; or we may fail to understand what happens and so new phenomena may appear and this would be uninteresting. Nature has so far never been uninteresting, but this might be so. These philosophical remarks may appear flippant but they are not meant to be. With such problems, we really get close to essential issues connected with the history of the universe, the fundamental structure of matter and the question : why is matter what it is ? It appears that these questions are being approached now or perhaps will be in the next few decades.

### The Question of Money

The practical side of the problem is, of course, the question of money. Can a government be responsible for devoting so much money to such a pursuit? CERN, as it is today, costs a little less than 100 million DM per annum (about £8m.) This is the cost of international high-energy physics in Europe. Germany's contribution is a little over a fifth of the total (the U.K. contributes about 25%). CERN is a very fine and successful institution which serves science with great enthusiasm and with great success. It would, however, be quite wrong to believe that such an effort is sufficient to serve the cause of science in the field of high-energy physics in Europe. On the contrary, the first job of CERN is to bring back Europe to a leading place in natural science, i.e. in the culture of our century, to the place where it used to belong. CERN's second task is to show that, through international co-operation, such a goal can be reached and reached more efficiently.

However, all that is only possible if CERN is in direct and intimate contact with the scientific world in Europe, if the roots of CERN are in all the laboratories, all the universities of Europe and are firmly anchored there. This is not possible if a country says of its contribution to CERN: "Now we have done enough for high-energy physics". It is only possible if, at home, in the universities and research laboratories themselves, people carry on these same scientific activities, discuss them and exploit them, if they build smaller instruments where students and young physicists are trained and where, when they return from CERN, they are able to pursue their scientific work. It has been estimated that, in the present state of high-energy physics, a country should spend 3 or 4 times as much as it gives CERN to have a sound scientific life in this field. This factor 3-4 is now reached in France and England, and up to a point in Italy.

These figures concern the present situation. The new instruments are naturally much more expensive: for instance, the 300 GeV machine will cost about 1.4 thousand million marks altogether (£120m.), although expenditure would of course be spread over the roughly ten years necessary for its construction. Assuming that Europe decides to build this machine as well as the storage rings - the storage rings are much cheaper, costing about 250 million (£21m.) - assuming that Europe has decided to build these machines, what would the yearly expenditure be when the programme is in full swing? At the beginning, one naturally spends less and then one reaches a kind of plateau. At this plateau stage, about 1967 and later, according to our calculations, high-energy physics at CERN with these two machines would cost about 400 million (£33m.) per annum, i.e. about four times as much as now, although the big machine would be ten times as large as the present one. It will of course take much longer to build. The contributions which European countries would have to pay to CERN would also have to be four times higher. Naturally, they should then also increase their own research effort though not necessarily by a factor of 4; one could expect that Germany, instead of spending 40 million (£10m. in the U.K.) as now, would devote some 150-200 million (£40m. in the U.K.) to high-energy physics by the end of the present decade. Is this justifiable or not?

Expenditure on pure research is very difficult to estimate. By pure research, one means research which bears no relation to any kind of applications: for instance, transistor or reactor research is not pure research. Pure research is the fundamental research described here or basic biological research or astronomical research, etc. For sound progress, it is believed that this research should absorb about one third per cent of the gross national income. Such is the case now in America and it is almost the case in both France and England. If one considers Germany, one third per cent of the gross national product would represent about one thousand million (in the U.K. about £80m.) and, in about six years' time, roughly 1.2 or 1.3 thousand million DM (in the U.K., £105m.). One should therefore talk in terms of such a sum to be devoted to pure research. High-energy physics is pure research but there are other types of pure research as well. How much should be allocated to high-energy work, considering the claims of astronomy, space research, biology, etc.? Some things are cheaper and certain things are more expensive. The scientists cannot help the fact that things are more expensive. The money therefore has to be apportioned.

### The Value of Fundamental Research

Why must one devote so much money to fundamental research? Only because it is done in America or France? There is a story which is often told in England: it took place in 1800, when Faraday had made his first electrical experiments. It so happened that a member of the government visited him and asked him what was the point of all these things he was doing. Faraday answered: "I do not know, but I am sure that your successors will some day levy a tax on it". Now one might perhaps add to this little story that the ideas Faraday was dealing with were not the very ones which brought in taxes, but, so to speak, the children and the grandchildren of these ideas, which Siemens put to use in making electric motors. It is probable that the same thing will happen one day with today's fundamental research. It is quite worthless speculating on the way in which mesons and neutrinos can be applied in practice. This is not how things work. Ideas develop and basic and fundamental ideas are not those which have practical applications. Faraday's experiments led to Maxwell's equations and the application of these theories produced the electrical industry.

If one studies the development of industrial nations, one cannot fail to make the following observations: in the first half of the nineteenth century, England was the great industrial nation and, at the same time, England produced the great names of fundamental research: Maxwell, Young, Faraday, etc. Then, in the second half of the nineteenth century and at the beginning of the twentieth century, Germany was the nation which took the industrial lead. It is then that one finds a galaxy of German physicists: Helmholtz, Nernst, Röntgen, Planck, Sommerfeld, Heisenberg, etc. Then, later in the twentieth century, as America became the leading nation in the industrial field, fundamental science blossomed out in America. There is a clear connection. It is often difficult to analyse what the connection is. One often questions the need for fundamental research; but the value of this fundamental research to industry does not lie directly in the ideas it produces. These, however, affect the whole spiritual life of a nation by determining its way of thinking and the standards by which actions and intellectual production are judged. This standard is something very important; the fact that science is considered so important and the fact that fundamental research is concerned with the most up-to-date problems, tend to create a certain intellectual level to which all intellectual activities, scientific or technical, must and do adjust. Some fundamental research students go into industry; the techniques which have to be applied to meet the stringent requirements of fundamental research serve to create new methods. I need only recall the short-time technique which was developed in high-energy physics. The style, the scale and the level are determinant in pure research, and that is what attracts productive people and what brings productive scientists to those countries where science is at its highest level. This is why so many good scientists move to America now.

To be sure, the German Government has many difficulties to contend with and there are calls on its limited resources from many sides. One thing can however certainly be predicted. If fundamental research does not receive the necessary support, Germany will not be able to occupy the place which belongs to her in the European family of nations.

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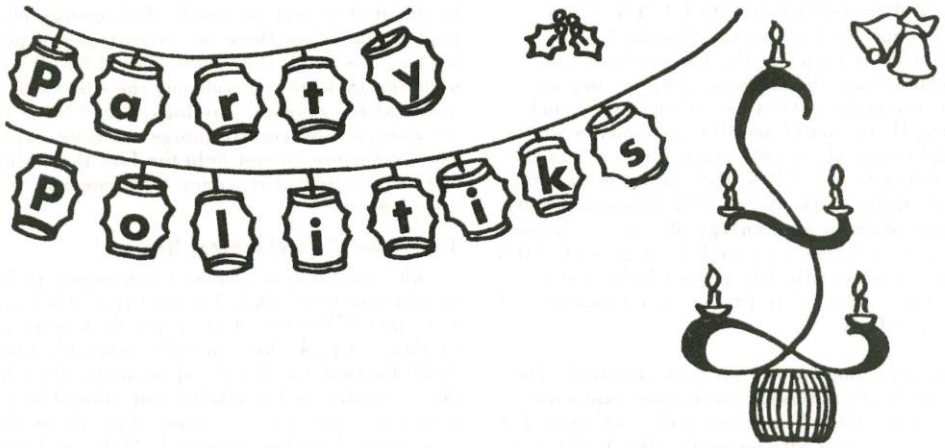


Reindeer bells tinkle outside the door of the room.

"Here comes Father Christmas now, everybody. Let's sing him our song".

"Jingle bells, Dingle bells, Jungle all the way,
Oh what fun it is to know, that you can pay your way,
Oooh, Jingle bells, . . . . ."

"Quiet children. Here is Father Christmas".

"Hurray".

"Hello Father Christmas".

"Hullo, Hullo, Hullo, Children." (Enter Mr. Quintin Hogg heavily disguised as a kindly old man, with a red cloak, a long white cotton wool beard and a large sack over his shoulder). "Are you all having a good time ?"

"We never had it so good Father Christmas".

"Ho, Ho, Ho. I have lots of lovely presents for everyone."

"Hurray."

"Good old Santa."

"Now who's first ?" (Father Christmas digs deep into his sack and comes out with a bundle of old fivers which he hastily replaces. His hand finally emerges with a brown envelope and he reads . . .) "For the Rutherford High Energy Laboratory."

A small girl with golden hair, dressed as a fairy in a crisp white dress, carrying a wand with a Rutherford Laboratory car sticker on top is pushed to the front.

"Hullo. Now let's see what we have for you. I know that you were rather naughty during the year and

PARTY POLITIKS (continued)

spent all your pocket money but you did do very well with your work and I think you deserve a lovely present.'

"Hurray."

The little girl shyly takes the envelope and tucking her wand under her arm, opens it and reads the slip of paper inside. The paper slips from her fingers and she breaks into quiet tears of joy.

"What does it say Santa Claus?"

"Read it out Father Christmas."

Father Christmas picks up the crumpled paper and reads....

"Her Majesty's Government guarantees the Rutherford High Energy Laboratory an annual growth of income of 10%".

"Hurray, Hurray."

"And now will you say your party piece for me."

"She's shy."

"Go on, don't be shy."

The little girl opens her eyes wide and begins to recite in a gentle voice.....

"Mary Mary quite contrary
How does your income grow
With rising prices and financial crises
And new projects all in a row."

"Hurray."

"Very good, very good. Now you sit down again there's a good girl..... Ho, ho, ho what have we here. 'For the Atlas Laboratory.' "

A tall boy with a far away look in his eyes, dressed as a wizard with a tall pointed hat and a black cloak covered in weird symbols, rises slowly from his place and glides to the front. Father Christmas hands him the envelope which he opens elegantly with long tapering fingers and reads in a dreamy voice.....

"Two dozen research fellows with nothing particularly in mind offer to take up posts at the Atlas Laboratory."

"Hurray, Hurray."

"Party piece, party piece.'

Oblivious to the clamour the boy recites distinctly

"One, two, what shall I do
Three, four, fill up the core,
Five, six, show all my tricks,
Seven, eight, make him wait.
One two three four five six seven,
The Atlas Lab. sounds just like heaven."

The boy glides back to his place leaving Father Christmas open-mouthed.

"Well now. Yes. Where were we?" Another envelope appears from the bag. " 'For the Daresbury Nuclear Physics Laboratory.' Now that is a lovely name isn't it, children? I wonder who thought of that?"

A wiry, active young boy jumps from his place, elbows his way forward and takes the envelope. He is dressed in corduroy, and has a Beatle haircut.

"Now let's see what we have got for you."

"Open it up. Open it up."

The boy tears open the envelope, unfolds the paper and lobs the crumpled envelope back into Father Christmas' bag. Father Christmas reads out....

"It's an agreement signed by all the tenant farmers within a ten-mile radius of Daresbury, for the National Institute to use their land for open cast mining if they want to."

"Hurray."

The boy leans over to Father Christmas. "Real gear. Yu know like. Ye...Who was the Judy?"

Father Christmas blinks and draws back sharply.

"Party piece", chant the children.

The boy jerks rhythmically into a Twist and sings..

" 'Twas on the good ship Nina
By God you should have seen her
The Captain's name was....."

Father Christmas coughs hurriedly and claps his hands. "Well done, well done." He steers the boy firmly towards his place.

"I know another one Santa....

She was only a physicist's daughter
But she knew all about strong interactions."

"Ahem, yes, yes." Father Christmas sits the boy down. "Well everybody, I have to visit lots more children today so I will have to leave you now. Enjoy yourselves. Enjoy yourselves."

"Don't go Santa Claus. We've got a present for you."

"There's a present for you, Santa."

"Oh, isn't that lovely. Now what on earth can it be?"

A brown paper parcel bobs its way to the front and Father Christmas carefully undoes the string and folds back the paper to reveal a plug on a chain.

"Oh! That is nice children. Now what shall I use it for do you think?"

"It's to block the brain drain, Father Christmas."

"Oh, thank you. Thank you. I've been looking for something like this for a long time. Thank you. Well cheerio children. Be good."

"Cheerio Father Christmas, cheerio."

And everyone agreed that
Father Christmas was a man without peer.

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*GEORGE H. HAMPTON, WHO RECENTLY TOOK UP THE POST OF DIRECTORATE MEMBER FOR ADMINISTRATION AT CERN, QUOTED A STORY OF A SCIENTIST-TURNED-ADMINISTRATOR WHO WAS TOLD BY HIS FRIENDS THAT IN FUTURE HE SHOULD LOOK IN THE MIRROR EVERY MORNING WHEN HE SHAVED AND SAY TO HIMSELF 'I AM EVIL - BUT AM I A NECESSARY EVIL?'*

*(CERN COURIER)*

# Closed for Alterations

..... this became the state of the PLA on Monday, 19th August, 1963. Twenty-four hours later it was definitely too late to turn back and eight weeks later still, the machine was operational again (on the scheduled date!) In those eight weeks much work had been done.

There was the connecting up and commissioning of the new pumphouse – this is the new building adjacent to the PLA cooling towers. Our original waterworks was installed beneath the accelerator and had inadequate instrumentation and control facilities – a most embarrassing state of affairs. This, together with one or two other deficiencies, has been remedied in the new pumphouse. We now have an installed capacity capable of dealing with about 1.2 megawatts.

Two years ago we were still using ignitrons as switch tubes on the modulators. Switching a 50-cycle pulse of up to 15 kilovolts at 300 amps seemed to be just too much for them and they failed so frequently that replacement became almost a conditioned reflex. Our salvation came in the form of a high-power, deuterium thryatron rated at 40 kilovolts, 15 amps mean, which was being developed by G.E.C. The ignitrons in Tanks 2 and 3 modulators were replaced by these about eighteen months ago with immediate success – one has now run for 6000 hours without fault. During the shutdown all the remaining ignitrons were replaced by thryatrons.

Then there was the work on the PPS – Polarized Proton Source. Three sets of coils were fitted in the vacuum chamber just above the ionizer. The coils are arranged mutually at right angles and when they are energised the resultant magnetic field can be made to point in any direction. The axis of spin of the proton (polarization) aligns itself in sympathy with this field – we can now give the ever demanding nuclear physicists, protons spinning in any direction.

The vacuum system also deserves some mention. It has been progressively improved to the point where it is now possible to pump down the tanks (15000 litres) and feed r.f. power into the cavity within 24 hours.

A 30 ton, double-focusing, 40 inch, spectrographic magnet, familiarly known as the N½ magnet, was installed in Experimental Area 2. It is D-shaped, stands about 14 feet high and can be rotated 320° about the target. With its aid, physicists will be able to measure more accurately the momentum distribution of charged particles scattered from various targets, at any selected angle.

A new rig has been set up for angular distribution measurements on neutron time-of-flight experiments. This has involved modifying the large clearing magnet and erecting it in a lean-to building at the end of a new 33° beam line in Experimental Area 1. Collimating cylinders, a shielding wall and two rows of counter tables are arranged in a series of concentric arcs around the target.

In the future we look forward ..... just a moment, we have had a signal telling us to get off the line and on with the job ..... it took the form of a dull thud from the transformer room. Before we go however, we must tell you about our running time – 90% of that scheduled during the last two or three weeks. If this is maintained it will establish the PLA as the most reliable accelerator in the world.

# Open for Improvements

At the time of writing Nimrod is engaged in its first 'long continuous run' providing accelerated beams. From 10.00 a.m. on Tuesday 3rd December until 10.00 p.m. on Thursday 5th December the machine will be run non-stop. This is the first long reliability test of all the equipment producing accelerated beams. Some of the experiments underway are concerned with injection from the 15 MeV linear accelerator into the magnet ring, improving the behaviour of the beam during acceleration by adjusting the r.f. programme, perfecting the magnetic field in which the beam travels and testing the targets which are flipped up into the path of the beam after it has been accelerated. Scattered protons and 'secondary particles', such as $\pi$ mesons, the tiny bits of matter which fly off when the beam crashes into a target, are being channelled down 'beam-lines' where, when the nuclear physics experiments begin, their behaviour will be investigated.

When this run is complete a week's shut down for some installation and maintenance work will take place and will also give time to reinstall one of the main power supply transformers which broke down shortly after the first successful acceleration and has now been repaired. Just before the Christmas break there will be a few more days machine running to ensure that everything is in order with the repaired transformer back in service. And then a shut down over Christmas week for a welcome breather.

Three weeks running after Christmas will serve to polish up the machine's performance so that $10^{11}$ particles per pulse can be obtained reliably and to ensure that the targets are operating as is required. A shut down for a week or so for the last big tidy up and final installation and we are away by the beginning of February on the first nuclear physics experiments on Nimrod. 600 hours of machine time, with the accelerator providing $10^{11}$ particles per pulse at a rate of one pulse every two seconds, have been allocated to experimental teams in this first batch of experiments with Nimrod.

# EDITORIAL

1963 has been a busy year at the Laboratory and our major achievement has been the successful operation of Nimrod with beams accelerated to full energy for the first time on 27th August. 1964 threatens to be even busier. Nuclear physics experiments will continue on the PLA and will begin on Nimrod. The Nimrod work will include counter experiments and it is hoped that some bubble chamber work will be possible in 1964. Assembly of most of the components for the Variable Energy Cyclotron will be completed ready for commissioning in 1965. The building to house the Oxford Electrostatic Generator Project will be ready early in the New Year and the machine will be installed ready for commissioning by late summer. The Ferranti Atlas computer will be installed in the Atlas Laboratory. These are some of the more obvious tasks facing us in 1964.

There is enough of interest in that list to keep ORBIT fully occupied and, since this is a Christmas Editorial let's say a little about what we have in mind for the New Year. One long term idea is to start an 'Around the Laboratory' series which regularly relays news from the different areas of activity. A criticism of ORBIT is that it concentrates too much on a few areas in the Laboratory and neglects others altogether. When ORBIT was first issued we tried to establish a chain of 'correspondents' in every section of the Laboratory but this system, in general, failed. Hence only the areas with which the Editor or members of the Editorial Board are in regular contact can be sure of having their news reported. In the New Year we will try again to set up contacts throughout the site. One recent move in this direction is that Jim Kerr from the R 9 workshops has joined the Editorial Board. This will give us contact with another group of people in the Laboratory.

A venture we ought to tackle in the New Year is a series of articles on Nuclear Physics. Since both the PLA and Nimrod will be at work on nuclear physics experiments it is about time everybody got some idea of what they are doing and why. If we manage to get this series underway we will try to ensure that the articles are as 'laymanish' as it is possible to make this intricate subject and we hope they will prove interesting and stimulating. It seems ridiculous but probably 80% of the Laboratory knows little or nothing about the work which is the very reason for the Laboratory's existence. If we can make some impression, however small, on this it will be worthwhile.

Both these possible future plans are concerned with the scientific-technical side of the journal and we possibly carry too much information of this type already. We feel there is a need for this sort of article and we try to ensure that they are written in a way that should be intelligible to most people with some interest in accelerators, high energy physics, computers etc ..... (and who on this site hasn't some interest when they are the lifeblood of our Laboratory and the source of our salary slips and wage packets). The 'leisure' half of the journal has always been more difficult to sustain at a reasonably high level and contributions of this type are always welcome.

Ted Higgins made some fair criticism in the correspondence column last month on the lack of pictures and a decent lay out. To use a better cover, incorporate photographs, justify columns of type on the right and use other devices to improve the appearance of the journal costs more money than we have at our disposal. But the point is taken and, within the limits of our resources, we will try to do something about it. By greater use of drawings in the last two issues we hope we have already made some small improvement.

Christmas is the appropriate time to thank all those who help in the production and circulation of ORBIT – the Editorial Board, whose advice and general assistance is invaluable; the contributors who are so ready to meet the Editor's requests for material (only in about half-a-dozen cases in 18 months has anyone declined to contribute something when approached); the printers, Technical Administration, Reading and finally the people who carry piles of ORBITs around depositing copies in offices and labs. all over the site. In particular we would like to single out Mrs. Burnish, the typist at Technical Administration for her interest, great help and patience and Dave Baker from R 9 workshops who has only recently begun to lend a hand as resident cartoonist but has already shown his enthusiasm and should prove a great asset.

It remains, on behalf of everyone connected with ORBIT, to convey our good wishes for an enjoyable Christmas and a happy and successful 1964.

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# Letters to the Editor

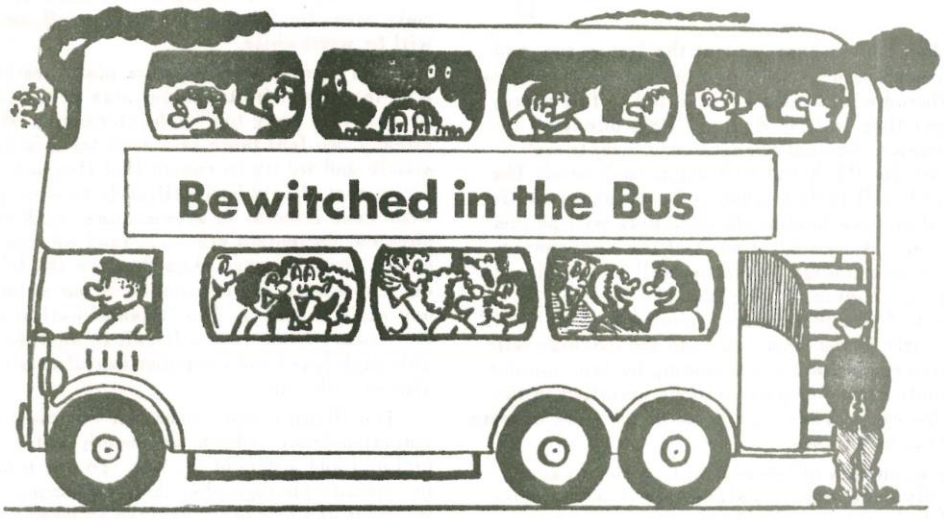
(Pseudonyms are accepted provided the authors name is known to the Editor).

Sir,

We greatly enjoyed Mr. Higgins's hilarious letter to ORBIT, in which he suggested that an engineer be appointed Minister for Science. Such a sense of humour is indeed rare in these austere and gloomy days. Being an engineer himself Mr. Higgins realises of course that one must be an able politician to obtain the top posts.

However we hold it very doubtful whether today's highly paid engineer could seriously be attracted to the post of Minister for Science, though a badly paid scientist might well be tempted.

THE THEORISTS.




When I was young - a teen-minus three ager - I met a witch. An ugly, real, Walt Disney witch. I was frightened and annoyed. I did not believe in witches. Father Christmas, fairies, gooseberry bushes or any other grown-up myths and the prospect of rethinking all these basic attitudes appalled me. But she was there, and in her hand was a pot of paint.

"Why do you carry that pot of paint?" I stammered, convinced that these were my last words as a human being.

"I am going to paint slogans," said she. "Modern society is unfair to witches; people no longer believe in us. They are too bored with life. No imagination." So saying, she blessed me and went on her way....

.....

It was Monday morning again. About eight Mondays to Christmas, and a neat row of freshly shaved chins were set against the misery making mist. Here and there a spot of dried blood marked the primitive wielder of cold steel, the chin tilted a little higher, proud of its ancient tradition and status. Did not the writings of Gillette confirm him in the upper quartile of he-men?

The chins nod in unison at my arrival and resume their silent wait. Their relative positions never change, they have a timeless fossilized quality, as though they have been waiting all night. A human Stonehenge. How do they do it? What is the transcendent joy in life that causes them to leap singing from their beds on a foggy Monday morning..... Why am I always last? How is it that I seldom manage to catch the bus at all? Have I somehow wandered from the warm Gulf Stream of life into a psychological Sargasso Sea? Maybe they take drugs. Secret hoards of some super American pep pill. Or could it be Yoga? I dismiss the thought. W------ is too fat, and fat men always come first. The subtleties of nature are infinite. Are they Nietzschean Supermen, existing in a state of Pure Will? One thing is certain - whatever they are, I am not.

The bus arrives. Protocol is observed and I am last to enter the grubby womb. Rudely, the first decision of the day is thrust upon me - whether to face the slings and arrows of tobacco fumes above, or the seas of female chatter below. (I have calculated that, before she is finally silenced, one lower deck passenger will have uttered $10^{24}$ words and not one of them will have been worth listening to). Holding my breath in best Buddhist fashion, I ascend into hell.

Bus designers should provide a special Limbo deck for neurotics who can't make decisions. This should be written into a British Standard Double Decker Bus Specification. No doubt such a British Standard Bus exists, filled to capacity with British Standard Persons singing 'Rule Brittania.' But one vital fact the designers have overlooked. Britons never never never will be standardized. Somewhere also, must exist the ideal passenger. A good humoured, gregarious, non smoking, non spitting, *THIN* man. A man not given to spasmodic flinging of limbs at right angels to his direction of motion. (This induces a spirit of rebellion in his fellows which could easily lead to a charge of civil commotion.) A sober man, with the fortitude to smile when a cigarette is stubbed on his new tweed, and fifteen stone of solidified Guinness descends on his non safety shoes. But it is not men such as these that founded the British Empire, nor even such men that lost it again. The bus design world is an unreal world. Ideal passengers are as fictitious as weightless strings and frictionless pulleys. Thus, to satisfy the perfection seekers we are all made to conform in neat rows in a carcinogenic fog on the top deck. We sit four in a row, 1, 2, 3, 4. Maximum advantage is held by passengers 2 and 3. Number 1 will be pinioned against the side, and will

BEWITCHED IN THE BUS (continued)

contract frostbite, acute respiratory trouble and claustrophobia. Number 4 will largely project over the end, and will develop an inferiority complex and remarkable physical characteristics. Passengers 2 and 3 will prosper, and can take turns in reading the 'New York Herald Tribune' (which, I believe, is very vast).

Needless to say, I am always number 4. All I can read are the advertisements on the roof. To a mind recently brainwashed by eight hours of sleep, the sudden impact of burning bungalows, brave men in fire engines, indomitable postmen etc., is just too much. One passes the boggling threshold, becomes in fact embogged in a surrealist fantasy of postmen pursuing Norwich Union Insurance agents up fire escapes.

All the jobs advertised, seem to involve a uniform. I suspect that somewhere in the depths – Worlds End, or perhaps Goosey – a small group of fascists are planning to take over.

First they must condition us to the sight of uniforms and establish a stranglehold on communications. Innocent men seconded from the local Labour Exchange to become bus conductors, will find themselves on assault courses of endless *STAIRS*. They will be amazed at the simplicity with which a double decker bus can be converted into a tank. Thus a hard core of Midland Redshirts will be formed. They will man a fleet of Sinister Black Buses *WITH NO WINDOWS*. These buses will ignore all traffic signs. The trinity of green, amber, red will be offended against and outrageous acts will take place over double white lines. To dent a Black Bus will mean 'life' – or longer.

If I stare at the postman on the roof he winks. 'It's a grand life', he says. The joys of cycling thirty-five miles in a blizzard are enormous. Promotion is frequent, and to Great Heights. Of what is not specified. Could it be a Higher postman; Principal postman; Postman without portfolio ? ..... What are the duties of a Principal postman ? To take charge of a small group of dauntless and devoted postmen in the Isle of Scragge, and to organise a maintenance scheme for seven bicycles and a sledge. Preference will be given to Gaelic speaking Sherpas; Salary £515 x 5 to £600; *PLUS BOOT AND SADDLE ALLOWANCE*.

And so it goes on, Monday after Monday, fantasy after fantasy. I think of my childhood witch and her blessing. Life is great but my imagination is a frightful curse.

# Personnel News

## Comings and Goings

R. Burton and E.J. Timson join Administration.

E.G. Westbrook joins Accounts; A.H. Fogg joins Nimrod Engineering.

Mrs. O.P. Nickson joins the Atlas Laboratory.

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L.H.Urwin, M.T. Chubb, J.C.V. Clark and F.D. Hanks have left us.

W.G. Ballard has retired on medical grounds.

## Congratulations to –

Phil Duke, High Energy Physics Group, on his recent marriage to Miss Flora Nell Howes in Philadelphia, U.S.A.

Peter Gill, Injector Group, on his engagement to Miss Elizabeth Jackson on 22nd November.

Paul Chatterton, Nimrod Beams, and his wife Margaret on the birth of a son, Christopher John, on 6th December.

Jim Reader, General Administration, and his wife Helen on the birth of a son, Phillip John, on 7th December.

## Suggestion Awards

Awards totalling £18 were made at the fourteenth meeting of the Rutherford Laboratory Suggestion Awards Committee held on Tuesday, 3rd December, 1963. Awards were made to the following :

£2 to F.J.Welch for his proposed modification to Lift switches so that trolleys can be safely loaded and off-loaded.

£2 to J.Scottorn whose suggestion that certain switches in Building R 9 should be moved to an alternative position eliminates a possible safety hazard and is to be adopted.

£3 to D.A.Hutchings for his proposal to facilitate the identification of "Inlet" and "Outlet" water lines. This suggestion has now been successfully implemented.

£2 to J.A.Wheeler whose suggestion sought to eliminate the damage caused to the paving surround of Building R 20 by vehicles being driven over the paving slabs.

£2 to J.Townsend for his suggestion regarding improved ventilation for the Telephone Kiosk in Building R 1.

£2 to A.Green in respect of his proposal for the easier identification of Diffusion Pump units by persons working in the Magnet Hall trench.

An Interim Award of £1 was made to C.Gascoigne pending further investigation of his suggestion for a lathe Vacuum Chuck by the Safety Officer.

Encouragement Awards of £1 were made to :

T.Crago and J.Crawford whose suggestion drew attention to a possible safety hazard caused by the perimeter fence adjacent to the junction of Roads 1 and 8.

E.Iberson whose proposed system for feeding gases to Building R 8, although practicable, would prove too expensive to readily implement.

E.G.Starr who drew attention to the need for sealing the Magnet Hall concrete floor, although his suggested solution of the problem is not to be adopted.

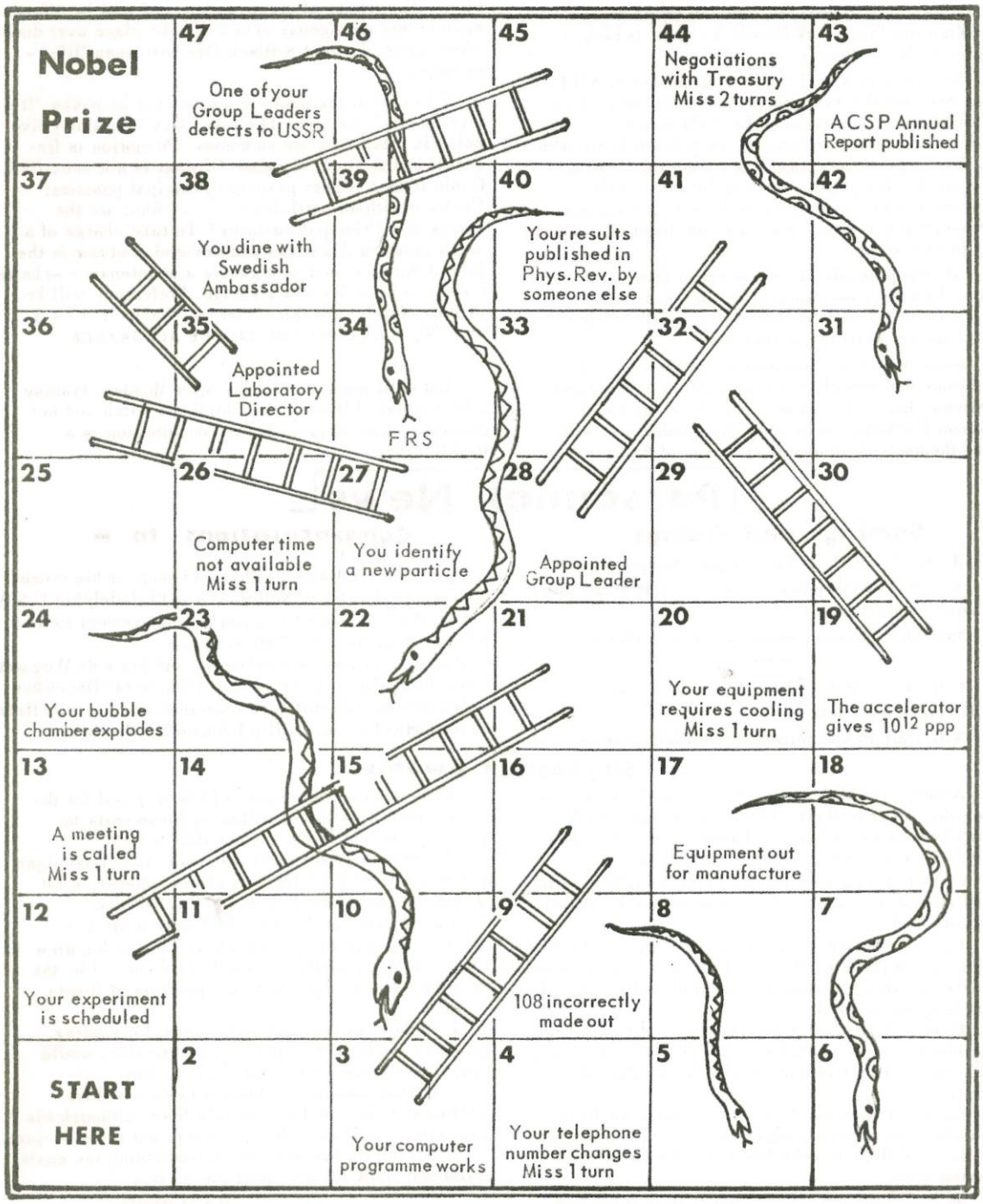
F.Burden for his suggestion concerning the easier maintenance of Rotary Pump assemblies.

D G J ROSE

# Snakes and Ladders

(from an idea by Phil Duke)

CAN BE PLAYED BY ANY NUMBER OF UNIVERSITY TEAMS.




NOISE IS PROPORTIONAL TO BANDWIDTH

# SNIPPETS

*TEA-TOTALLER* writes, "The PLA tea-machine, which has been in operation for about 2 years, has just registered its 80,000th cup. This has triggered off some calculations, the results of which may be of interest:

£670 worth of pennies, weighing 1½ tons, have been fed in. If laid edge to edge they would go round the Rutherford Lab. perimeter fence twice, or if stacked vertically would reach a height of 930 feet, about 4 times as high as BEPO chimney and only 57 feet short of the top of the Eiffel Tower.

The electricity used is roughly equal to the energy stored in the Nimrod magnet at full current. The total volume of tea produced would just fill Tank 2 of the PLA or, if thrown onto the floor of the PLA tea room (often the best place for it), the depth would be 2 feet 6 inches."

*HALSBY AND CO. LTD. ARE MARKETING A NEW ITEM OF OFFICE EQUIPMENT WHICH GOES BEYOND ANY MILD SUGGESTION OF REDUNDANCY AND THREATENS OFFICE STAFF WITH ACTUAL PHYSICAL VIOLENCE. IT IS KNOWN AS THE 'TYPHOON SECRETARY SHREDDER'.*

The Rutherford Laboratory has an arrangement with the International Press-Cutting Bureau whereby the Bureau sends along all the press cuttings they see concerning the Laboratory, Nimrod, NIRNS and so on. Recently, the following cutting arrived and no-one can think why .....

Extract from 'Tailor and Cutter' 4th October 1963

'*CRAZY HATS*

Some of the craziest, hattiest hats that I've seen for a long time were on view at the Simone Mirman presentation last week. But though they were crazy, most were practical with it, giving as much muffled protection for the head, as the wrapped-up garments will for the body, and the sturdy shoe styles for the feet.

Madame Mirman had designed hats which framed the face, protected the ears and often wound round the neck. Particularly favoured were all kinds of snoods and balaclavas, whimples and bonnets, many with high pointed crowns. Tweed was the predominant fabric in many gay designs and colours, with much fur following.'

GOVERNMENT WHITE PAPER

A CHRISTMAS LECTURE

Deciphering the Ryder Diaries

by

K. L. PERRIN, M.A.

(By kind permission of the Earl of Harrowby)

Thursday, 19th December, 5.30 p.m.

Conference Room R 1.

## CHILDRENS CHRISTMAS PARTY

The proceeds from the Christmas Dance arranged by Electrical and Mechanical Services for 13th December will be used to finance a children's party. The party will be held in the Restaurant from 2.00 till 6.00 p.m. on Saturday 21st December and will be attended by Father Christmas and 150 of the children of Electrical and Mechanical Services personnel.

The organisers (whose wives will watch over the 150 revellers) of the Dance and the Party were Jim Kerr, Eric Kirby, Stewart Worley, Peter Champ, John Pilcher, Dave Powell, Ron Hecken, Ivor Spencer and Vince Marron willingly helped by everyone around them. They would have liked to see the whole Laboratory involved but the idea arose too late for so large a project.

Headline in 'The Guardian'
12th December
" 'Ha'p'orth of tar' outlook threatens NIMROD's chances".

*FOR SALE:* Do-it-yourself Nobel Prize kit - Accelerator (post war model), Un-used, Ideal for Enthusiast. Owner cannot afford upkeep.
£11,000,000 o.n.o.