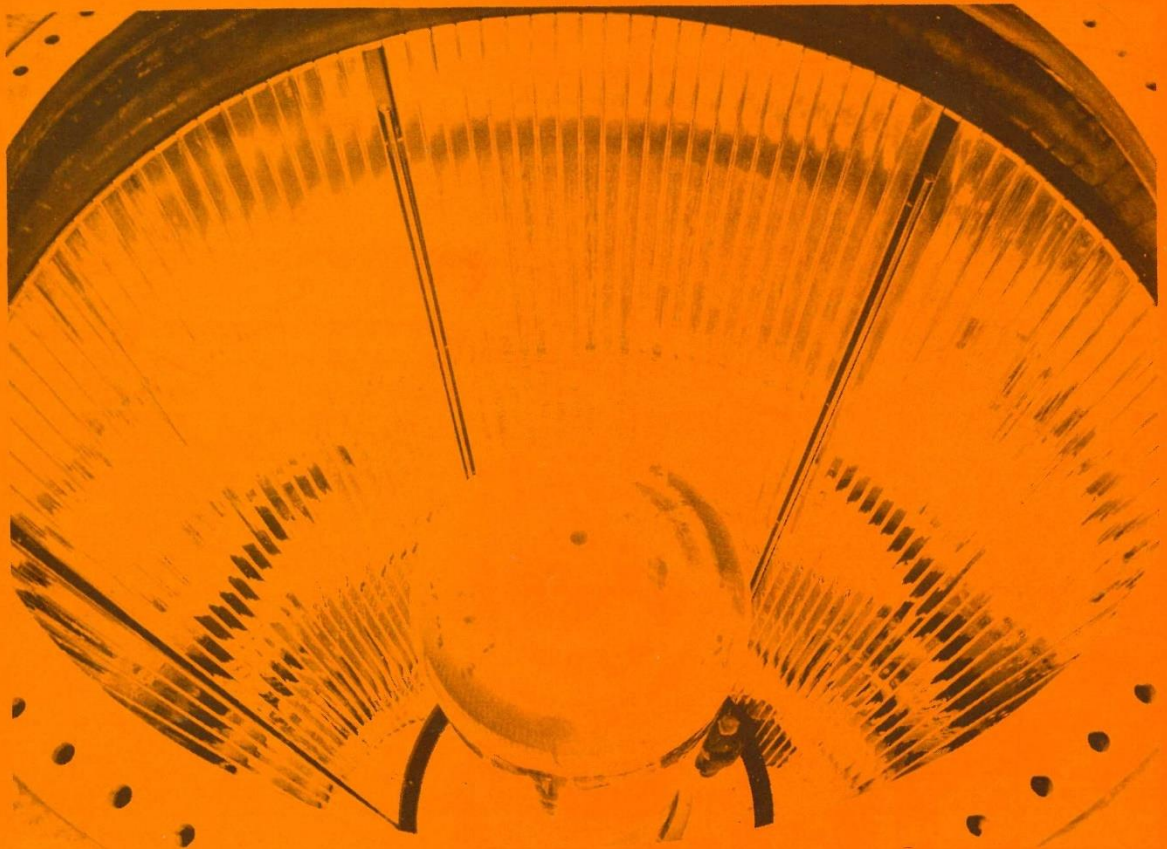




orbit

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Journal of the Rutherford High Energy Laboratory



Cover: Looking into the Injector at Oxford.

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Electrostatic Generators at Oxford

Dr WD Allen

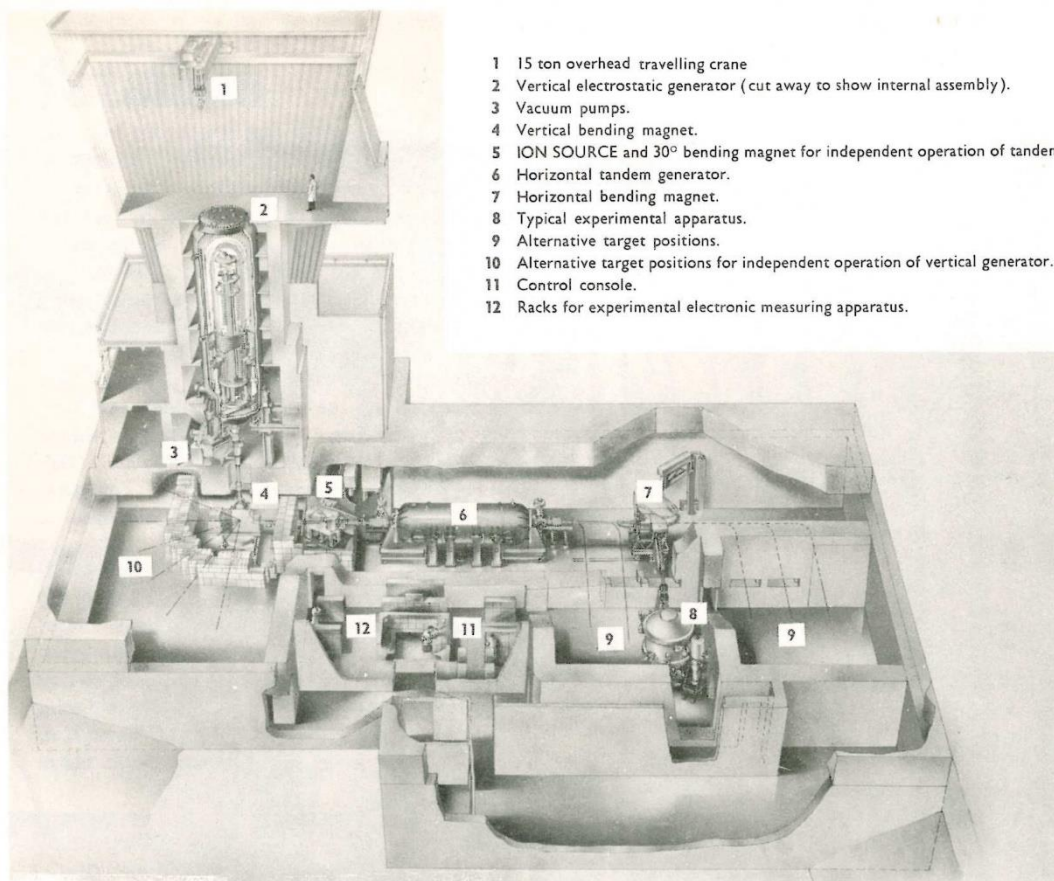
Nuclear structure physics is chiefly concerned with the excited states of nuclei - their energy levels, spins, parities and so on; and in this field the electrostatic generator with its precision (which is of the order of one part in 10,000) and its flexibility (both in energy and type of particle) is a very useful machine.

Physicists have been using tandems, or charge changing generators, for many years: the maximum attainable energy with the standard tandem is some 14 million volts, although the Emperor tandem now being constructed in some American laboratories has a performance guarantee of 10 million volts on the terminal, i. e., 20 million electron volts total energy for protons. At Oxford, we have reached 20 million volts for protons with a compound system, injecting (into a standard tandem) negative ions, not from earth potential, but from an injector operating, on this occasion, at -9.25 million volts.

An electrostatic generator is not a machine for which a design figure can be accurately specified: one can make an estimate from radial electrostatic fields, but thereafter it is largely

a matter of how well or otherwise the job is done. For the injector, the design figure was 8 million volts (7.5 was the "rock-bottom" figure), with 10 million as a probable upper limit. It will therefore be seen that the voltages achieved with the beam (between 9.5 and 10.2 M.V. for different ions) are reasonably satisfactory. The project as a whole has had its set-backs: the building was about 12 months late, and accelerating tubes and the annular lift platform were sources of trouble. However, the delay on the building saw many improvements built into the ion source, and the overall time of 18 months between commencement of the injector stack installation to handover is not great for a machine of this type.

As regards performances, the demands on the ion source, which were considerable, have been satisfactorily met. An important feature of this project is that the ion source is at high potential in a vessel containing 3 tons of gas: it can therefore be described as somewhat inaccessible, and reliability is at a premium. Life tests on the source for different ions generally ended after several hundred hours because of the boredom and/or exhaustion of



- 1 15 ton overhead travelling crane
- 2 Vertical electrostatic generator (cut away to show internal assembly).
- 3 Vacuum pumps.
- 4 Vertical bending magnet.
- 5 ION SOURCE and 30° bending magnet for independent operation of tandem.
- 6 Horizontal tandem generator.
- 7 Horizontal bending magnet.
- 8 Typical experimental apparatus.
- 9 Alternative target positions.
- 10 Alternative target positions for independent operation of vertical generator.
- 11 Control console.
- 12 Racks for experimental electronic measuring apparatus.

OXFORD ELECTROSTATIC GENERATOR

Figure 1 (HL. 40614)

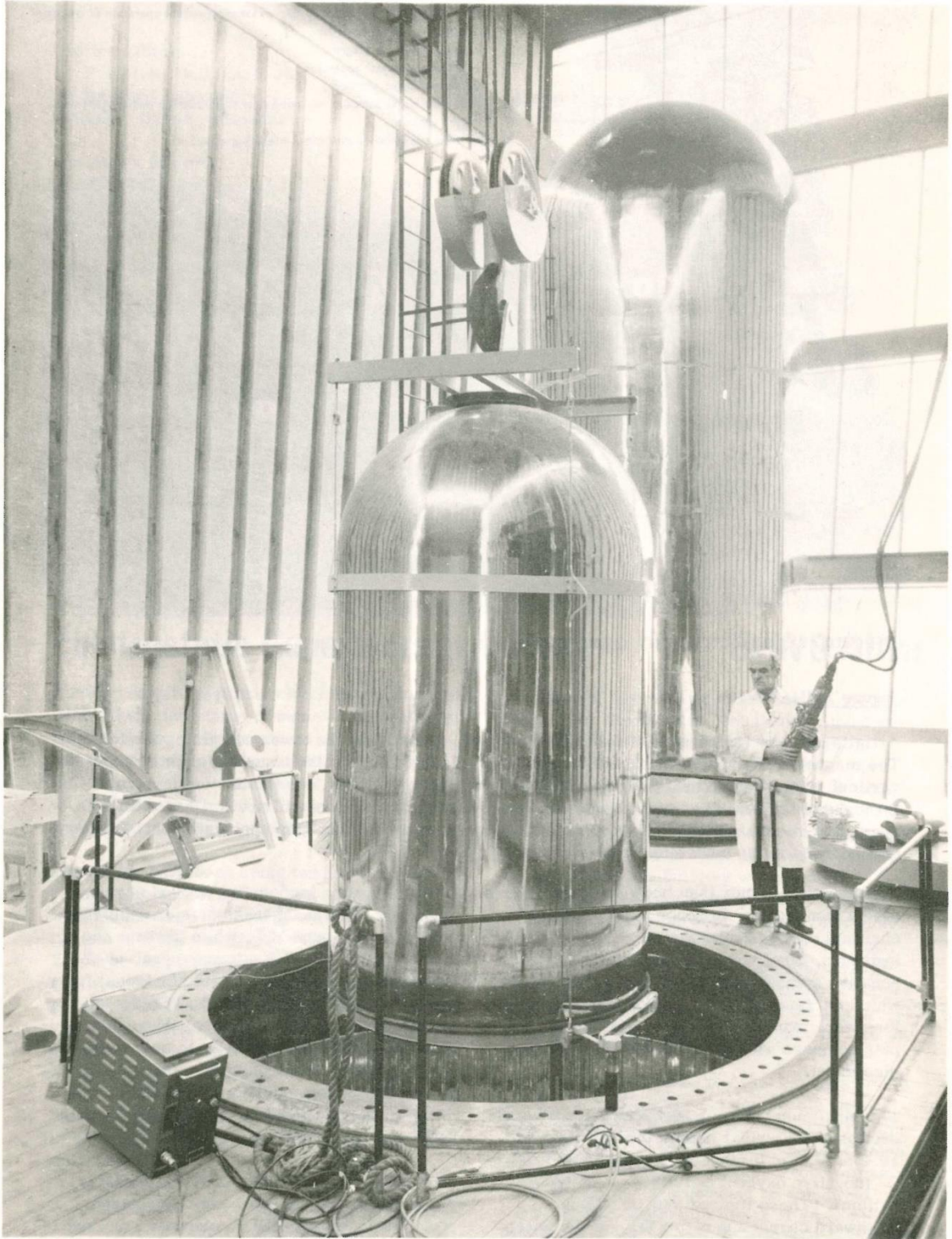
Artist's cutaway impression of the Oxford project. Top left is the tower containing the injector. The magnet in the basement beneath the pressure vessel deflects the beam and rotates about a vertical axis: either into the injector target room (bottom left) or into the tandem (centre). Once through the tandem, the beam is again deflected through 90° into one of several beam lines in two target rooms. The only experimental set up shown is the multigap spectrometer. The control room is in the centre foreground.

the operator, rather than because of the failure of any component. In bench tests, resolved currents of 30-40 microamperes of negative hydrogen, 20 of negative oxygen and 10 of negative sulphur were regularly available, which currents of positive hydrogen and helium ions were many times these figures: these outputs compare well with comparable sources elsewhere.

The maximum voltages recorded for the acceleration of individual ions in the machine are: 10.2 M.V. for H⁻ (negative hydrogen), 9.5 for O⁻ (negative oxygen) and 9.7 for He⁺ (positive helium). (These figures may be subject to a downward correction of 2-3%). As the latter beam was stripped of its electrons half way down the machine, what was actually observed was a beam of 15.6 MeV alpha particles.

Coupling to the tandem has proved easy and efficient. The least transmission efficiency recorded has been 12%, while perhaps the best performance was 0.9 microamperes of O⁶⁺ (oxygen atoms stripped of six electrons) from an injected O⁻ current of 1.3 microamps. One must bear in mind, of course, that 0.9 microamperes of O⁶⁺ is equivalent to only 0.15 microamperes of O⁺: but since this is only one of several beams in different charge states, the effective transmission efficiency is quite high.

The machine was handed over to the Department of Nuclear Structure on 31st March. Together with the PDP 7 computer, the multigap spectrometer, and many other instruments, the tandem and injector accelerators form a combination which augurs well for the future.



Fatalism

DO YOU BELIEVE that all accidents occur according to a pre-determined plan or programme by an unforeseen power, and that it is beyond human control to change the course of these events? If you believe in this theory of inevitability, you are probably a fatalist. You must also know this theory has never been substantiated by facts and thus remains a theory.

One cannot believe in safety and at the same time be a fatalist. However, we actually have people who believe in the inevitable theory or that when your time or number is called, you must go. There are many arguments that tend to disprove the theory of fatalism that are disregarded. For instance, we constantly are lowering accident frequencies where we install accident prevention programmes. This, in itself, should convert the fatalist. It would be more accurate to say life is a gamble. You win or lose in accordance with the chances you take. If you do it often enough, you will lose. In light of this, we should realize we should avoid chance for safety's sake.

In other words, we can control chance or exposure. The human is given powers of responsibility which exceed that given to any other form of life, and not a built-in programme. All other forms of life must live according to a built-in programme, that is, their lives are controlled by the Laws of Nature from which they cannot deviate. We, as humans, differ in that we can say "no" to nature or deviate from its laws. We can change our pattern of life and all the environment about us. We have been given that power of creativeness or ideas but, at the same time, we have been given the responsibility of making the right decision in



order to prevent disaster to ourselves as well as those around us. "We are put on our own". Too often we fail to exercise wisdom and meet up with disaster after which time we find ourselves in trouble.

Human frailties of this type are responsible for some accidents but more often we fail to stay alert. We must realize accidents are caused and if we can visualize or anticipate the effect of our actions we can remove the cause of accidents. We must remove from our minds superstitious and mysterious reasons for accidents and realize that accidents are caused. We must eliminate defeatism, for fatalism is defeatism.

Reproduced from The Safety Committeeman (September 1965) with acknowledgements to Dept. of Labour and Industries, Washington.

Which?

George and Petal had recently been married and when I saw him he was looking very pleased with himself.

"I've already demonstrated the power of mathematical reasoning to the wife" he said. "Before we were married she used to go twice round the three supermarkets here in order to get all the bargains, but she hasn't the time to spare now. So I told her how to ensure that, in the long run, she gets about half the best buys with at most one visit to each shop.

"I assumed that no two shops charge the same price for an article, and this is what I told her. 'Go to the first shop and write down the prices of all the articles you want, then go to the next shop and buy all the items there that are cheaper than at the first, finally at the last shop buy the rest.

"To see that this gives Petal an even chance of getting the best buy. Look at it this way: if I write A for the cheapest articles, B for the next cheapest and C for the most expensive, then there are six different orders in which they can occur, thus

<u>1st shop</u>	<u>2nd shop</u>	<u>3rd shop</u>
A	B	C
A	C	B
B	A	C
B	C	A
C	A	B
C	B	A

If the actual order is BAC or BCA or CAB the article she buys will be the cheapest. So that, assuming all orders are equally likely, she can expect in the long run to get the best buy just half the time".

Pleased with his idea George later admitted to having sent Petal out to get a 1 cwt sack of compost. There are ten compost shops in town, and again George assumed that they would all be charging different prices. What were his instructions to Petal in order that, without visiting any shop more than once, she would have the best possible chance of getting the cheapest compost?

Herman

Solution next month.

Perturbations

Scientific progress is not a conflict (like a game or a war) that a nation can win or lose. It is a co-operative endeavour in which the exertions of each benefit the rest, and in which leadership is measured by contribution to the general advance.

The argument that individuals with a talent for (basic scientific) research should be supported by society differs little from arguments formerly advanced in support of the rights of the owners of landed property to a leisured existence, and is accompanied by a similar assumption of superior social worth of the privileged individuals over common men.

- Extracts from an advisory report on "Basic Research and National Goals" submitted to the U. S. Congress last year; the section from which these extracts are taken was written by Harry Johnson, professor of Economics, University of Chicago, and was reprinted in the "Bulletin of the Atomic Scientists" (December 1965).

6

As others see us - Jonathan Miller reviewing Truman Capote's In cold blood, "The Listener", 17 March, p. 395:

"An obscure, rootless hero . . . , head filled with shapeless and extravagant ambitions, is driven through the middle of an indifferent community and collides with it in a glory climax. It's rather like the device used by the nuclear physicists in which a charged particle rushes through a sealed vessel of dark vapour, brushing up into brief visibility everything with which it comes in contact".

The best way to make people creative is to insist that they produce something new.

I can take a man with perception and make him a mathematician, but I can't take a Ph.D. in mathematics and make a human being out of him.

Professor Drucker ("The Manager" January 1966)

Reflections on a Monday Morning

What do I really do?
I try to be an executive.
What then are my duties?
To decide what is to be done and then
Tell somebody to do it
Listen to reasons why it should
Not be done
Be done by someone else
Be done in a different way
Prepare arguments in rebuttal that are convincing and conclusive
Follow up to see that it has been done
Find that it hasn't
Enquire why it hasn't been done
Listen to excuses from the person who should have done it
Think up arguments to overcome the excuses
To follow up again to see if it has been done - and
Discover that it has been done incorrectly
Point out how it should have been done
Conclude that as long as it has been done it may as well
be left as it is
Wonder if it isn't time to get rid of the person who did
it incorrectly
Reflect that a large dependent family is probably involved
Conclude that a replacement would probably be just as
bad, or worse
To consider how quicker and better the task would have been
done if I have done it myself in the first place
To reflect that if I had done it I could have finished it
correctly in twenty minutes, but, as things turned out,
I have spent two days trying to find out why it took
someone three weeks to do it incorrectly.
To realise that such a reflection strikes at the very
foundation of the belief that an executive has nothing
to do and that in any case because someone else
has had a change of mind it wasn't really necessary
to do the thing at all.

DUODENAL

Suspicion Confirmed

I think I can safely say that nobody understands quantum mechanics.

The Character of Physical Law - R. P. Feynman

The grass is greener on the other side of the fence

Because it is viewed at a shallow angle.

Colin R. Walters.

Room for a new Research Council?

VAMPIRES - Any information for research purposes gratefully received.

Personal Column, The Times, 25th February.

PUBLIC NOTICE - I, L. RON HUBBARD of Saint Hill Manor, East Grinstead, Sussex having reviewed the damage being done in our society with nuclear physics and psychiatry by persons calling themselves "Doctor" do hereby resign in protest my university degree as a doctor of philosophy (Ph.D) anticipating an early public outcry against anyone called "doctor" and although not in anyway connected with bombs or "psychiatric treatment" or treatment of the sick, and interested only and always in philosophy and the total freedom of the human spirit, I wish no association of any kind with these persons and do so publicly declare, and request my friends and the public not to refer to me in any way with this title - signed L. Ron Hubbard.

Personal Column - The Times - 8th March.

THE Accelerator WORLD

News and views from the world of high energy physics, accelerators, and computers.

The 200 GeV Accelerator



The National Academy of Sciences has reported to the AEC on its findings for a proposed 200 GeV accelerator site. A recent press statement reads:-

The locations recommended without ranking by the Academy are:- Ann Arbor, Michigan; Brookhaven National Laboratory at Upton, Long Island, New York; Denver, Colorado; Madison, Wisconsin; Sierra Foothills, near Sacramento,

California and South Barrington or Weston, near Chicago, Illinois. (It now seems certain that the South Barrington site will be withdrawn from the list given above. Apparently the locals are worried, amongst other things, that the influx of scientists would "disturb the moral fibre of the community". In this country any such feelings are more usually reduced to the simple expression, "they atomics", which could mean anything - See New Scientist. 14.4.66.

In response to a public announcement last April, the Commission received 126 proposals for siting the planned accelerator centre. These recommended more than 200 locations in 46 States.

After a review of all proposals, the Commission asked the National Academy of Sciences to evaluate each proposal on which there was sufficient information to indicate the location met the minimum site criteria. There were 86 such proposals suggesting more than 150 different tracts in 43 states. The criteria specified at least 3000 acres meeting certain conditions with respect to water, power, geology, and other factors.

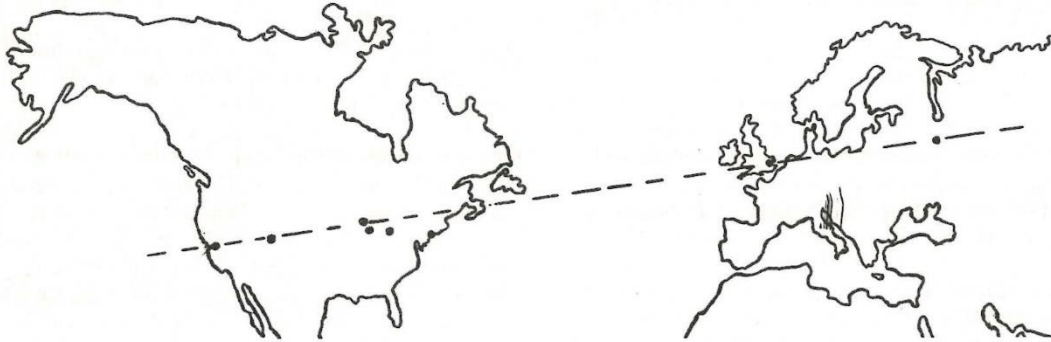
The Commission now plans to carry out additional studies. The completion of this work and analysis of the resulting data may take several months.

Double-take?

Big particle accelerators have been in trouble lately. Nimrod, the big machine at Geneva broke down last month.....

New Scientist, 3 March 1966.

Future 300 GeV Accelerator Site



Finding a site for a new high energy accelerator can be quite a difficult problem⁽¹⁾. What help can we give to those people who have to find a site for the European 300 GeV PS? Shakespeare⁽²⁾, as usual has anticipated the problem and tells us:

"The Heavens themselves, the planets and THIS CENTRE
Observe degree, priority and place
Insistence, course, proportion, season, form,
Office, and custom, IN ALL LINE OF ORDER".

Obviously he was telling us this centre should be on the "line of order". Unfortunately our accelerator physicists do not read books too well⁽³⁾ and have therefore remained in ignorance of the help that men of letters have been giving them. Coleridge⁽⁴⁾ tells us quite clearly:-

"Choose thou whichever suits the LINE"

and again Arnold⁽⁵⁾ speaks out like a clarion:-

"We in some unknown Powers employ
More on a vigorous LINE"

The problem then resolves only to - what LINE?

We may answer this question by remembering that particle accelerators started, almost simultaneously, in two centres - Cambridge, England and Berkeley, California. Surely the LINE must pass through the holy places of Nuclear Physics! The diagram shows such a line joining Berkeley and Cambridge. What of the large accelerators at present under construction? As may be seen both Serpukov (where the Russian 70 GeV proton synchrotron will be operating, possibly next year) and Stanford (20 GeV electron linac) lie on the LINE.

The reader will not be surprised to learn then, that five of the six sites selected as suitable for the American 200 GeV accelerator⁽⁶⁾ lie on this LINE. (See map). The fact that Brookhaven lies off the line by some 250 miles may be attributed to a navigational error of the early Dutch settlers who, suffering under a surfeit of Hollands Gin, intended to site New Amsterdam at the mouth of the St. Johns River rather than the Hudson.

How does all this help those who have to site the European accelerator?

We need do no more than point to the map - MUNDFOUR lies on the LINE.

One point remains to be cleared up: why has CERN

"Profan'd the God- giv'n strength, and marr'd the lofty LINE"⁽⁷⁾?

The slight displacement of CERN from the LINE is in fact a second order quark of nature produced by inversion of IKS matrix operating on the SPAL vector current found in the neighbourhood of Geneva.

Perhaps the patient reader will comment with Macbeth⁽⁸⁾

"What! wil the line stretch out to the crack of doom?"

SAM'L. H. II. O'PART

The holiday season is approaching and cameras will be dusted and made ready for use. Some people will be buying a new camera and the following article may prove helpful in making a decision. We should like to thank the Photographic Information Council for permission to reprint it in Orbit.

What they are doing to your Photography by Harold C. Wyld (Photographic Information Council).

They are at it again! !

The "They" in this case being members of that inventive band of people who put shaving soap into press button containers, who dehydrate soup and pack it into foil envelopes, who put petrol into coin operated pumps. All developments which make life a little easier.

Now "They" have had a go at Britain's top hobby, Photography. You may not know an aperture from a shutter speed, or a telephoto lens from a hyperfocal distance . . . and "They" are making sure that it really will not matter. You will get technically excellent photographs and movies every time you press the button.

If, like most people, you are anticipating the start of the really bright weather and the Summer holidays, you will probably be thinking in terms of some photographs or movies to recapture it all during the Winter months. Possibly you do not have a camera or, perhaps, you are thinking of buying a new one: if that is the case then you will need to know what "They" have been up to in making photography easier than ever before.

Quite simply, the new camera systems remove all the technicalities, leaving you, the user, free to concentrate on composing an attractive picture in the viewfinder.

For the still cameraman there are two major systems which use special cartridges of film. With one the film cartridge is self-contained and completely encloses the film itself. It is dropped into the open camera, the camera back closed, the film wind operated and - presto! - you are ready to take the first picture. The second system uses a different design of cartridge; this is slipped into the camera the back closed and, as the wind mechanism is operated, the film travels automatically across the back of the camera and into another similar cartridge. When the film is used up, the camera is opened and the now full second cartridge removed for processing.

Correct exposure, focusing the lens and, even, winding the film on between exposures is taken care of by the various cameras designed around one or other of these two easy-loading systems. The very simplest cameras are designed to take picture in bright light or with flash (some have the flashgun built in), but as you pay a

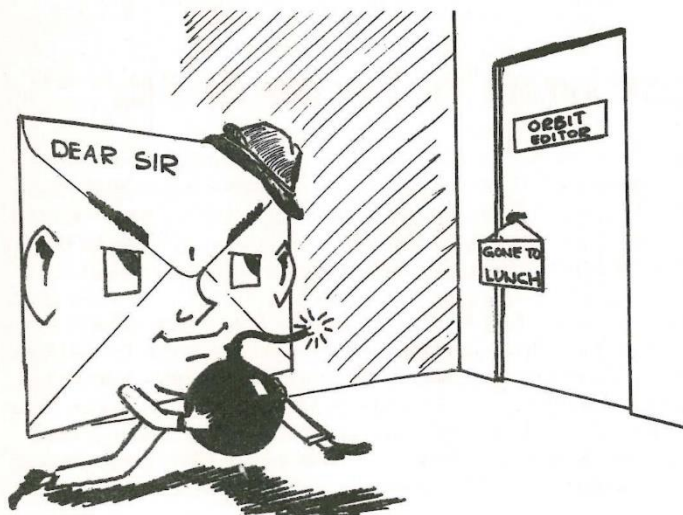
little more so the scope of the camera models is increased and good pictures can be taken even in very dull conditions.

Should you be considering cine, then the new "Super-8" and "Single-8" easy-loading methods are worth noting. As with the easy-loading methods of still cameras, all technicalities are looked after automatically. As you pop in a cartridge of film, the camera automatically senses what type of film it is (colour or black and white although the latter is not available yet) and its speed (in other words, how sensitive it is to light). None of the minor irritations of the older Standard-8mm. movie cameras are present: no turning the film round half-way through a reel, no threading, no exposure meter settings and no risk of spoiling film by loading in too bright a light. It's all very fast and easy to use . . . and just how it should be when you want to concentrate on what is going on in front of the viewfinder!

Even the most automatic of cameras will not look after a few points though!

1. Steady: Hold the camera firmly and squeeze the shutter release - this prevents blurred pictures caused by camera shake. If you use cine, you should, generally speaking, avoid any rapid movement of the camera especially when panning across an attractive landscape.
2. Come closer: Fill the frame with your subject and avoid acres of redundant space in your still pictures. Movie-makers should try to take close-ups whenever possible to show the action in detail, using an occasional distant shot to establish where the scene is taking place.
3. Ware of blue: At high altitudes and on sunny beaches there is often an excess ultra-violet light. You cannot see it, but your colour film can record it as a blueish cast. Solution: slip an inexpensive "U.V." filter over your lens.

As I stated earlier, the Summer holidays are not far away. It would be a shame not to have a really good photographic record of them . . . and the new easy-to-load and easy-to-operate camera systems are well worth considering to make sure that you don't miss out!



Letters to the Editor

Dear Sir,

In his article in the last issue Dr. Ralph Thomas makes a cynical reference to politicians playing.

I believe that by their present attitude, particularly to their own kind, the politicians must bring a lot of such abuse on their own heads. But I also believe that the majority of them take their work very seriously, and that this flippant attitude of a senior scientist invites a reciprocal attitude from the politician to the scientist.

In the realm of selling anything, including science, one does not go around insulting one's customers. Mutual respect is the order of the day.

Colin Walters.

Sir,

The recent article 'Like Folk' (Orbit, February 1966) was interesting and no doubt enjoyed by many people unfamiliar with folksongs and their "presentation". As a result, I would like to comment on the content, as a means of dispelling a few misconceptions that could arise from it.

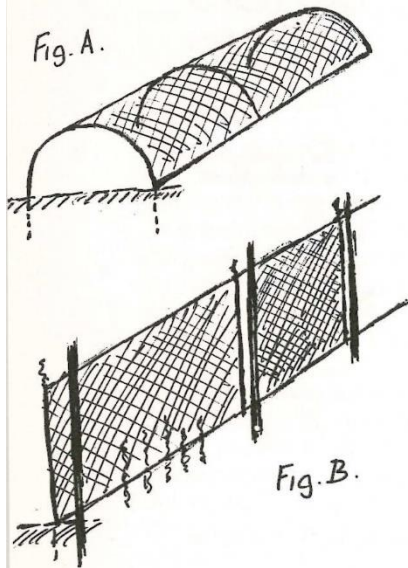
Only a minor proportion of national folksong has an occupational origin. The hard core of any such collection, e.g., that of Child or Sharp, is made up of old ballads and songs relating mainly to the various moods, hazards and consequences of the male-female relationship. Furthermore, folksongs are not "written", in the sense that authorship is very rarely known. Rather, they have evolved over many years from the traditions of the civilisation or society concerned, and form an integral part of the national heritage.

Secondly, the performance of traditional song with instrumental accompaniment is a comparatively modern practice. The use of an accompaniment is not mandatory, and should in any case be the result of subjective interpretation by the singer. In other words, an instrument may be used to enhance the mood or quality of a song, but not solely, or even largely, to please a prospective audience. The latter practice is the first step towards commercialisation, which is rightly pointed out to be a hazard rather than a help.

Finally, many of the best-known and respected folksingers were not originally professionals, and gathered followings because they sang for their own pleasure, or as a way of life. Their respect for the tradition surrounding their material has in turn earned the respect of the listeners. Examples of these devotees are Fred Jordan and Bessie MacDonald in Britain, and Doc Watson and Hedy West in the United States. In general, it seems that folksinging is rather a way of life than a professional career.

Robin Johnson.
Wantage Research Laboratory.

A Suggestion For The Kitchen Garden



Bob Pepperall gets a lot of enjoyment from growing crops of fruit and vegetables each year that usually more than meet his family's needs. Here is a tip of his that simplifies the "sticking" (provision of support) of peas of the popular small varieties (18" - 24" high). These pea-rows can of course be left to straggle on the ground, but the crop suffers.

His method is to cover the row with the standard wire guards at the time of planting (Fig. A). When the plants are 2" - 3" high (usually safe from bird-pecking), the pea-guards are straightened to a roughly vertical position, and staked every 2' - 3' with thin rods (wooden rods 2' 6" long obtainable by the 100 very cheaply from all horticultural shops), to give the line added anchorage. Nothing more need be done - beyond weeding and picking (and possibly bird-scaring) until the season is over.

Bob adds that you will get neat rows, between which if you leave 3' from row to row you have clear space for intercropping with, say, lettuce, radish, etc.

The simple ideas often pay off.

Orbiting Around

Editor: H F Norris
Building R20, Ext. 484.

The Magic of Oxford

First impressions of life at Oxford, by Frank Borsay

We British like to know what foreigners think of us. For this reason this article might get some attention from people of the Rutherford Laboratory who in overwhelming majority are still British. This is not so at Oxford.

For instance: The little group where I work consists of the supervisor who is an ex-Polish man and three research students. One is an American, the other is an Indian and I who am an ex-Hungarian. There are rumours that soon a Chinese and a Scottish student will join us. I am probably working and mixing with a particular part of the Oxford community which is full of foreigners and because of this my view is distorted as far as the general composition is concerned. It seems to me that there are at least as many if not more of them here at Oxford as Britons. This is certainly true at college gatherings of postgraduate students and if I count the Irish and the Scots as foreigners, in the common rooms of the Engineering Sciences Department also.

Generally speaking Oxford consists of four kind of people: a) Senior University Staff, b) Junior University Staff, c) Students d) Others. -

There is a little vertical mixing between the four groups but there is a very lively social life horizontally. At least three times a week we have people visiting us or we are visiting others. There are very good plays and concerts at Oxford which we did not know or did not bother about before. These activities cut down my TV viewing time dramatically, but the alternative is more attractive.

Most of our friends come from the research-student community. It is surprising how much talent, enthusiasm and true brilliance is at Oxford. Anybody worried about the future of mankind should come here for a cure. The name of Oxford works as a powerful magnet and attracts the best from all over the world. (There are lucky exceptions though!) This is a good investment for Britain because even if they are unhappy here as soon as they are back

at home they turn to be ardent anglophiles.

Previously I always imagined that at least the older senior members of the University were stuffy old men who lived in ivory towers, had a sweet and easy life and were cut off from reality completely. Nothing could be further from the truth. Interesting life: yes; sweet and easy: no. Everyone has to work jolly hard, because of the terrific competition. The ivory tower is a fiction and unexpectedly they are more "with it" than it shows on the surface.

Colleges are the centre of social activities during terms. They bring philosophers, engineers, scientists, physiologists, etc., together and provide facilities at the common rooms and at the dining tables for fruitful cross-fertilization of ideas.

Working conditions are ideal for theoreticians but for experimental research, institutes such as the Rutherford Laboratory have advantages over the University. (Better facilities and a lot more money!)

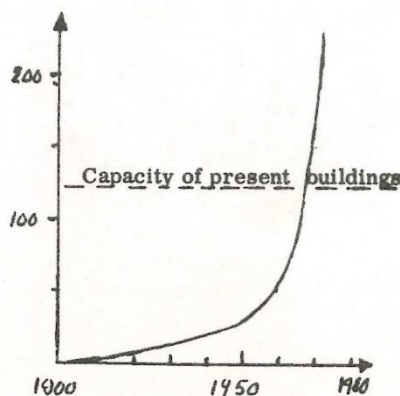
The Engineering Sciences Department has grown enormously since it was founded in 1908. There were only two students at the start. In a few years from now the annual intake of undergraduates might well exceed 200! The upwards turn of the graph started in 1957 when Professor Holder took over the Department. As the graphs show the number of students soon will reach the capacity of the present buildings. It can only be hoped that the want of

material essentials will not limit this tremendous upsurge of engineering education.

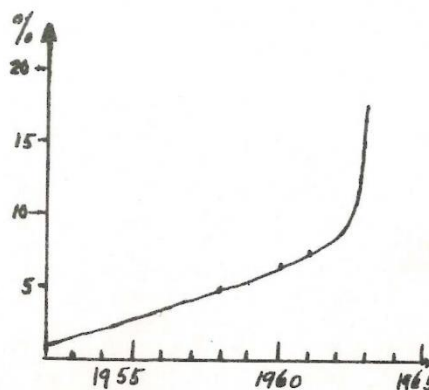
It helps my work to a great extent that I come from the Rutherford Laboratory. While the University is full of first class engineers (by the way the word engineer in Oxford, just as in the Continent and in America, is as good as scientist!) for obvious reasons there are more practical specialists at Harwell. - The name Harwell includes the Rutherford Laboratory as well. I am afraid this is how everyone refers to it and no amount of correcting seems to make any difference. - Of course I try not to bother people too much. It is surprising how much one can learn during a short consultation from the right man. Even A. E. R. E. has its share of my quest for knowledge and the theoretical physics department especially helped me a great deal.

I take this opportunity to express my sincere thanks to all the people who were patient enough to put up with me in the past and I hope should there be need for it in the future they will be as generous as they were before.

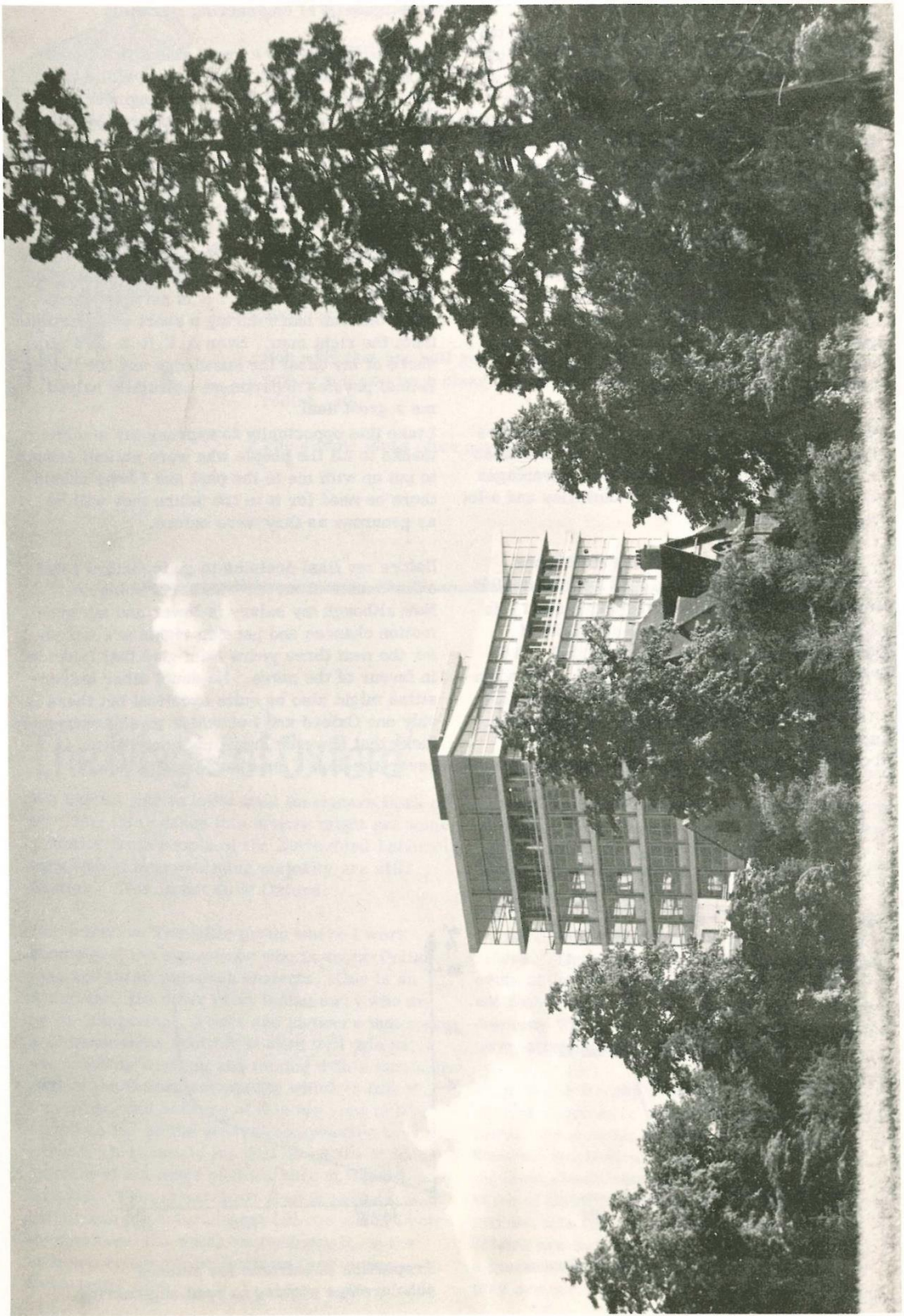
Before my final decision to go to Oxford I had a few doubts about the wisdom of doing so. Now, although my salary is lower and my promotion chances and pension rights are frozen for the next three years I am glad that I decided in favour of the move. No doubt other universities might also be quite excellent but there is only one Oxford and I consider myself extremely lucky that however small my contribution is never-the-less I am also part of it now.



The annual intake of undergraduates.



Proportion of entrants for science scholarships wishing to read engineering.



And Once There Were Four

With the recent resignation of Audrey, the Jeffries contingent has dropped to Mick, Audrey's husband, in salaries section and Tony, at the Atlas Lab, whose wife used to work in the Construction Group.

Audrey has worked in the Bill Paying Section for the past two years. She will be missed by her colleagues, not only as a cheerful associate but also for the specialised knowledge on banking, foreign currency, import duty etc. We wish Audrey every happiness in her future life.



Suggestion Awards

At the thirty-sixth Meeting of the Suggestion Awards Committee held on Wednesday 30 March 1966, the following awards were made.

- £1.10.0. to C.Wallis whose suggestion to fix a guard rail by the R8 bus shelter will be adopted.
- £2.10.0. to W.Buxton for the suggestion to fit an oil shield on No. 2 and No. 7 ram has been adopted.
- £1.10.0. to W.Black whose suggestion had removed a safety hazard in R 2 Mess Room.
- £2. 0.0. Interim award to W.Buxton for his modification to a Thames Valley Fridge Unit.
- £3. 0.0. to A.Richards whose design of a small portable compressor for refrigerator maintenance had been adopted.
- £1.10.0. to L.G.Denton whose suggestion concerning the size and punching of RHEL catalogues will be adopted.
- £3. 0.0. to D.W.Tansley for his locking device for super conducting magnets.
- £5. 0.0. joint award to R.C.Chitty and G.A.Collins for their method of speeding up foil stretching by use of welding techniques.
- £2. 0.0. to D.J.Price whose suggestion to fit emergency stops to R 2 milling machines has been adopted.
- £1.10.0. to Miss J.Towers whose suggestion concerning First Aid courses for Patrolmen will be adopted.

Encouragement awards of £1 were made to D.A.Hutchings, P.Roper, E.G.Starr and Mrs.M.C.Gould.

Photo:
Engineering Laboratory
Parks Road, Oxford.

Helen Woodcock. Secretary.

Comings and Goings

Dr W R Holley joins HEP Counter (Resident) Group; G J Gehani joins HEP Counter (Visiting Teams) Group; P E G Hingston, P Swadling, R H Niven and B W Warner join Nimrod HEPE Group; D S Barlow joins Nimrod Machine Physics Group; G W Flitter joins as a Craft Apprentice.

G E Pullinger, W Burgess, K G Louch, D E Meck, T M Sedwards, M T Watson and K Johnstone join Bubble Chamber Group; J P Singal, M D Bishop, R S Rees and T J Pointer join Nimrod Engineering Group; B L Clark, N P G Oaked and B F O'Regan join Central Engineering Group; W F Clark joins PLA Engineering Group.

Mrs H F Parkin, Miss J C Jackson, Mrs P Kinsey, Mrs C A Smith, Mrs S A Turk, Miss J Sharman, S J Plester, P S Hill, P F O'Keefe, B Calvert and D G Yates join General Administration.

P Kent, Miss P L Brown and Miss R A Wickens join Atlas Operations Group; R J Rolfe, Mrs B Hessian and Mrs K Northover join Atlas Administration.

B E Belcher, J K McHugh, Miss H G Cottingham, T D Edmonds, I Green, D A Hutchings, P Shawcross, I R L Tucker, R A Coffey, G S M Hedges, Dr J B Hawkyard, P Odle, Miss R Borbone, C H G Smith, Miss D Cherry, Miss P. Tero, J E Gurney, B T Lancelott, M H Ourbridge, W C J Smith, R G Page, R Roberts and P D Roper have left us.

Congratulations to:

Tony Payne, PLA Accelerator Physics, and his wife Joan, on the birth of a daughter, Amanda Margaret on Monday 4 April.

Dennis Pickles, Central Engineering, and his wife Carol, who until recently worked in the Salaries Section, on the birth of a daughter, Gillian on Easter Saturday, 9 April.

Peter Mace, Machine Physics Group, and his wife Julie (who, suprisingly enough left Reproduction Section at Christmas) on the birth of a son, Martin Peter, on Tuesday, 12 April.

Jim Shurman, R. 9 Workshops and Amelia Cheshire on their marriage on Saturday, 23 April.

Record Programmes

Programmes will be held every Tuesday in May at 12.30 p. m. in the Lecture Theatre.

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| 3 May | "La Boheme", Puccini |
| 10 May | Benjamin Britten's "Spring Symphony" |
| 17 May | Jazz at the Concertgebouw Amsterdam with the Dutch Swing College Band. |
| 24 May | Piano Concerto No. 1 and Hungarian Fantasy, by Liszt with G. Czyfra as the soloist. |