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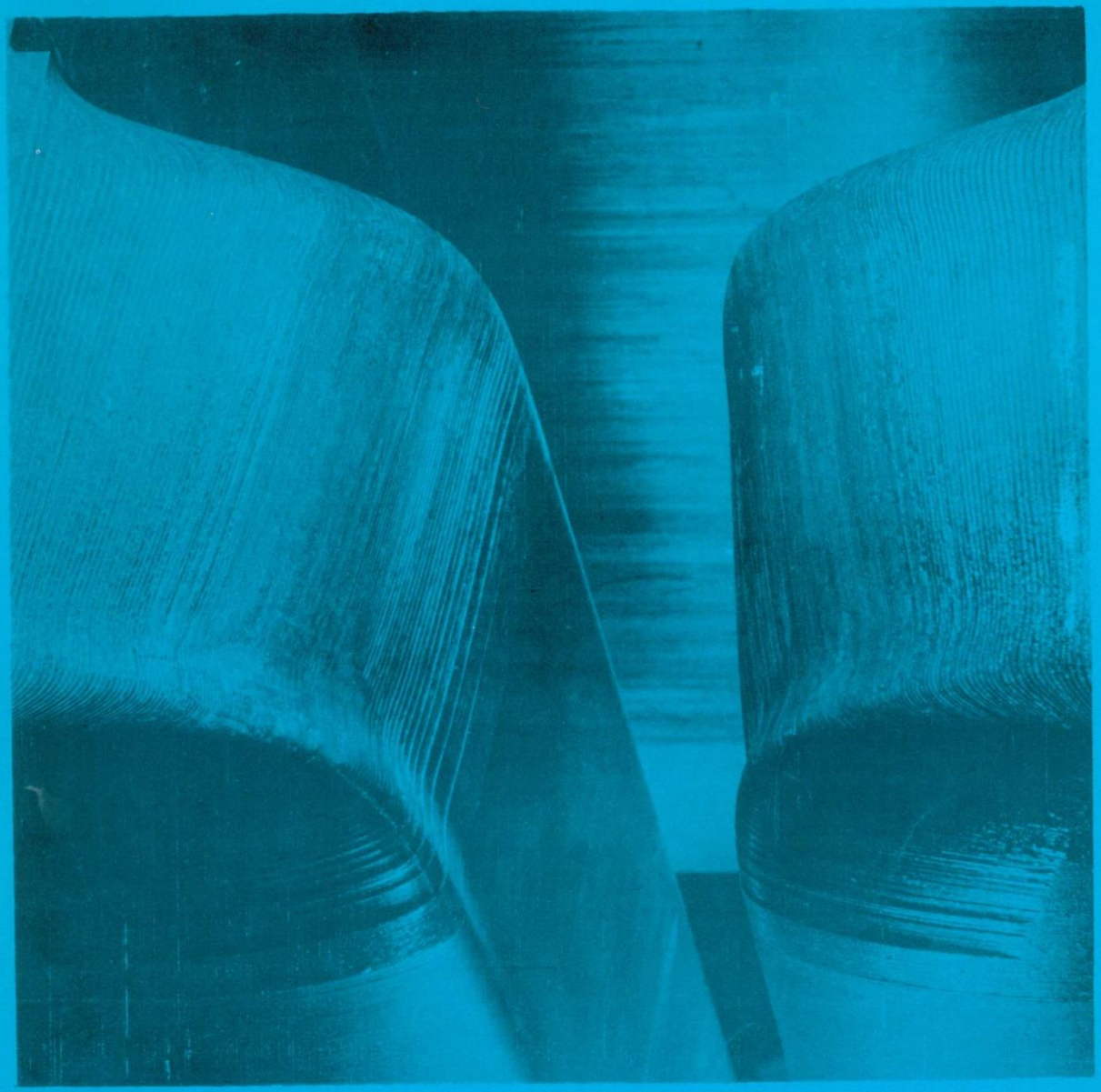

Cover photograph:
Poles of the NINA magnet

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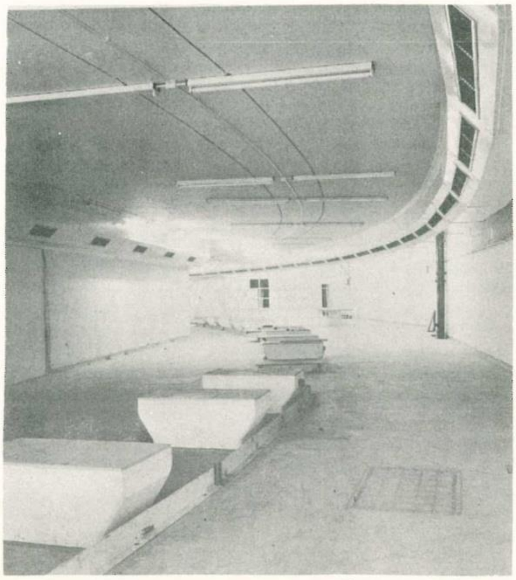
In November 1963, the virgin soil of Daresbury in Cheshire was violated in the name of science when work began on the construction of the Daresbury Nuclear Physics Laboratory. In less than two years, an almost incredible amount of progress has been made. Virtually all the major building is complete. The accelerator is well advanced (the gum boots which were needed to look at NIMROD during its first years of construction are nowhere to be seen). The programme date, June, 1966, for the start of full commissioning has every chance of being met, and by the end of September, accelerated beams should be achieved. University teams are already on site and the number of permanent staff has reached 170 out of a proposed total complement of 400.

The Machine

The accelerator is the 4 GeV electron synchrotron, NINA - National Institute Northern Accelerator, whose physics potential will be complementary to the Rutherford Laboratory's proton machines. It is a strong focusing machine, with a magnet ring 200 foot in diameter. Forty magnets, aligned to an accuracy of one part in 240,000, form the ring in a FODO pattern - focusing magnet, long straight section, defocusing magnet, short straight section - giving many long straights for access to the beam. The magnets are 9 foot long and weigh only 13 tons each. 6½ kilogauss in the magnet

The NINA ring building. The tops of concrete piers, which sink down at least 24 foot to the sandstone rock, can be seen awaiting their magnets. These magnet supports are independent of the ring building structure.



The Daresbury Nuclear Physics Laboratory

aperture is necessary to contain a 4 GeV beam and since the magnets are capable of 9 kilogauss, energies up to 5.3 GeV should prove possible. The maximum aperture available to the beam is 6.5 cms horizontally by 3.7 cms vertically. Magnet surveys are underway as the magnet blocks arrive. Delivery of the magnet coils has been delayed and this is the holding item in the current machine programme.

The most vivid impression to anyone reared on NIMROD, is the small scale of the NINA magnet ring: 400 tons of magnet compared with 7000 tons; centimetres of aperture compared with an aperture that people can crawl down. It is like a man who drives a Rolls being shown that you can do the same things with a Dinky and it brings home the great advance that the development of the strong focusing technique in accelerators has proved.

There are five radio frequency accelerating cavities (triple cavities) on the ring and the RF system is designed to be capable of accelerating 1.2×10^{12} electrons per pulse at 4 GeV with a repetition rate of 50 pulses per second. This represents a mean current of 10 microamps which, if it can be reliably achieved, will make the beam intensity from NINA considerably higher than from any other synchrotron in the world. After successful tests, the RF equipment has recently been moved and assembled in its permanent position in the inside of the magnet ring.

The vacuum chamber is being made of titanium alloy and stainless steel coated with glass fibre reinforced epoxy resin. It will be built up of 10 equal sectors separated by shut off valves and each sector will have four ion pumps with an additional pump for each RF cavity. Rotary pumps and high speed turbo-molecular pumps take the pressure into the ion pump range. The desired operating pressure is below 2×10^{-6} torr.

A linear accelerator will inject electrons at an energy of 40 MeV into the synchrotron ring. It is designed to inject up to 500 milliamps, with a pulse length of 1 microsecond. To provide for the acceleration of positrons in the synchrotron, it will be possible to introduce a heavy metal target in the injector. Incident electrons will produce bremstrahlung which will convert, deeper in the target, to electron-positron pairs. Some of the positrons will be focused by a magnetic lens for injection into the ring. It is thought that 10^8 or 10^9 positrons could be accelerated to full energy.

It was estimated that the NINA project would take four years from the time the first spade went into the earth to the time when physics began on the machine. In fact it looks as if it will be completed in three years. This is a remarkable achievement which the Daresbury people put down to several factors - the support from the high energy physics community, especially from the Advisory Committee under Professor Chadwick; the work of the Atomic Energy Authority's engineers and contracts

Lord Bridges, then Chairman of the National Institute for Research in Nuclear Science, laying the foundation stone at Daresbury on 16 June 1964.

November
1963

officers based at Risley, who have looked after the building and civil engineering side of the project and provided an inspection and control service; the enthusiasm of the Laboratory's own staff, which is everywhere in evidence - not one disinterested voice was heard in a day of talking to many people. Another important factor has been the willingness to draw to the full on other peoples' experience. A great deal of preliminary work was saved by taking over the ideas of the established electron synchrotron Laboratories (CEA in America and DESY in Germany). Also, having made the initial decision, modifications, which might have brought about improvements at the cost of the machine programme, were not tolerated unless they were absolutely necessary.

The Experimental Programme

The experimental facilities at Daresbury are intended to serve especially the Universities of Liverpool, Manchester and Glasgow. (To cultivate this relationship the Councils and Senates of Liverpool and Manchester and Senior Representatives from Glasgow were invited to visit the Laboratory on 12 July). Also the M6 motorway brings other Universities, such as Lancaster and Keele within easy striking distance, and Ringway and Speke airports are not far away. Teams from Liverpool, Manchester and Glasgow, together with a resident HEP team of five physicists, are already installed at the Laboratory planning experiments. In July, for the first time, a "working weekend" was held when probable NINA users got together to discuss the experimental programme.

The experiments can be put into three categories -

The study of nucleon structure: This work was pioneered on the Stanford electron linear accelerator by Hofstadter, who was the first to identify a proton structure. The latest investigations, by a Harvard Group on the Cambridge electron synchrotron, indicate that the proton has not got a "solid" core.

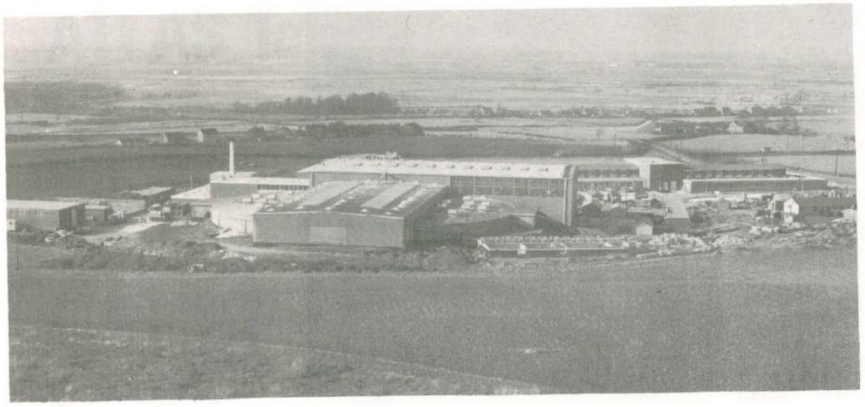
The study of resonances and short lived particles: There are some advantages in using fluxes of photons and electrons as opposed, for example, to a beam of pions to investigate especially the higher resonances. With particle beams the contribution from lower resonances can be so high that it is not easy to detect and study the higher resonances. Also the "Drell effect" predicts that it should be possible to produce intense beams of pions and kaons by high energy photons.

Refined tests of quantum electrodynamics: The predictions of quantum electrodynamics have been found to hold down to distances of about 10^{-14} centimetres. More refined investigation might indicate a limit to the theory at shorter distances.

Experiments in all these three categories are being planned using counter and spark chamber techniques. There will be an external electron beam and an external positron beam is being considered.

Several interesting features, which will smooth the course of the experimental work are worthy of comment -

The distribution of supplies (electrical cables, water cooling ...) to beam lines and control rooms in the Electron Hall (the experimental area) will be done via overhead cable trays from distribution points fixed at intervals along



March
1965

he wall of the Hall. Let into the floor of the Hall on a 10 foot matrix are holes to receive 2 inch pipework to carry the trays. The pipework can go up to any height, to clear shielding or other obstructions. Thus, using standard components, with floor support already established, it should be possible to take supplies to any point in the Electron Hall quickly and cheaply. The saving in time and expense when changes in the experimental programme occur could prove considerable.

A high capacity, extensive underground duct system enables supplies to be connected between the Electron Hall, the accelerator ring and all the small laboratories on the site. The system has been built in such a way that it can easily be extended if for example a new experimental area is added at a later date.

To avoid the trouble and delay of dismantling and reassembling especially detection equipment which has been built up and tested at a University, or at one of the small laboratories on the site, prior to moving into the Electron Hall, a caravan system has been developed. A well sprung caravan, to withstand the hazards of the British roads, has been designed to carry assemblies of equipment from a University to Daresbury. At the site, the equipment can be worked on further while the caravan sits on a hard-standing outside one of the small laboratories (where special windows have been incorporated through which supplies can be fed out to the caravan). Finally the caravan can be moved into the Electron Hall to become part of the experimental equipment for a beam line.

The Site

The Laboratory site is really rather splendid. It is difficult to remember as you turn off the A56 Warrington-Chester road at Daresbury, down for half a mile between the green banks of narrow Keckwick Lane, that the squalor of southern Lancashire is only five miles to the North. Across the A56 is the church associated with Lewis Carroll, author of "Alice in Wonderland". Charles Lutwidge Dodgson, who used the name Lewis Carroll for his writings, was born at the Daresbury parsonage on 27 January, 1832. The Mad Hatter and all the other famous Alice in Wonderland figures appear on the stained glass windows to the right of the main altar in the church.

It is the Bridgewater Canal which makes the site itself, and the Laboratory architects obviously decided to use this feature prominently when they designed the site layout. The Laboratory Restaurant is built on the banks of the canal. (The building is almost complete and it will seat about 110 people.) Cooling water is taken from the canal and fed back in, after passing through heat exchangers, one and a half miles away. (There are a couple of fish tanks in one of the buildings which will be filled with used water to check whether the fish population will be affected by any contamination introduced.) It is planned to use the canal in other ways also in the future.

The buildings themselves are dull, functional boxes but the offices have distinctive furniture and the Laboratory is spared the abominations of the standard civil service tables and chairs. All the units of the Laboratory are kept very close together and compact: the office and laboratory building is linked via a corridor to

A modern Stonehenge. Magnet support piers of the NINA ring.

the accelerator buildings. As yet there is no accommodation for a computer but approval is expected very soon for computing facilities, which will then be housed in a separate building.

Everyone gathers twice a day in a large common-room for tea or coffee (as at the Atlas Laboratory). This is another of the advantages of being a comparatively small establishment.

A few miles away, overlooking the valley where the site is situated, is "Norton Lodge" which has been acquired on lease from ICI to accomodate the University visitors. The Lodge is very spacious and comfortable and has sleeping accommodation for eighteen people.

The Laboratory under its Director, Professor Alec Merrison, now faces possibly its most vital year with the final stages of NINA's construction, the commissioning of the accelerator, and the preparation for the first high energy electron beam experiments to be done in this country. It seems sure that they will tackle all these things with the confidence and competence that has distinguished the Daresbury Laboratory from the start. They will enter a branch of high energy physics where two Laboratories will be well established (possibly three, if the synchrotron at Yerevan in Russia is completed soon) and some of the cream of the possible experiments may be skimmed off by the time Daresbury is underway. But they are confident of making significant contributions to high energy physics just as soon as they can get the beams to work with.

The place is alive; the people are enthusiastic; the relationship with the Universities is already excellent; there seems every chance that the Daresbury Laboratory will be a great success.

Alec in Wonderland ?

View across the canal of the laboratory and office block

ATLAS Take-Over

Dr J Howlett
(Director of the Atlas Computer Laboratory)

The Atlas Computer has officially been taken over from the manufacturers, I.C.T. Limited. This decision was reached at a meeting on 15 July 1965 when, after reviewing the performance of the machine over the past three months, it was agreed that take-over should date from 19 May. This does not complete the contractual negotiations: the succeeding year is a period of probation and only if at the end of this we are satisfied with the machine's performance do we finally accept it and make the last payment.

When I wrote about Atlas in last November's ORBIT, I said that we hoped to take it over before the end of 1964, adding that it was rash to make predictions in public. It did prove rash. Progress had been very good in the latter part of 1964, but towards the end of the year it slowed down and in early 1965 even seemed to have come to a stop. The trouble was, basically, the interaction between 'hardware' and software'. The machine itself, the hardware, is a large and exceedingly complex assembly of electronic circuits and electro-mechanical devices such as card readers and punches, magnetic drums and magnetic tape decks. Its operation as an integrated system is controlled and monitored by an equally large and complex program called the Supervisor. The two interacted in a most complicated way, so that it was often impossible to say whether a fault was due to a failure in the hardware or to a mistake in the Supervisor program; and as the simpler sources of trouble were cleared out, diagnosing and correcting those that remained became increasingly difficult.

Everyone concerned had a pretty anxious time during the first three months of 1965 and when the contract date for take-over, 31 March, approached I had the distressing task of saying that I would not accept the machine: it was not reliable enough. Even so, it was getting through a large amount of useful work every day and we had got on well with the development of Fortran and Algol compilers and with the production of library programs. In April, things began to change rapidly and performance to improve quite dramatically. This was clearly a threshold effect: once the number of faults had been brought below some critical level the engineers and systems programmers could see what was happening and tackle the faults which then arose with much greater understanding and chance of success. We set a target for standard of performance which we considered would justify acceptance and at midnight on 19 May this was attained.

A few figures will give an idea of the way the Laboratory is now working. We have the machine from 9.30 a.m. to midnight, Monday to Friday; the maintenance engineers take it for an hour at some convenient time, usually around 6 p.m. We are getting about 90% good time each week, that is about 60 hours out of a possible 67½. The best week we have had so far (5 July to 9 July) gave 95.7%. In a typical week we will run 1,500 jobs, read 350,000 cards into the machine and print out 1,000,000 lines. Sixty per cent of jobs take less than one minute, 3% more than 30 minutes. The machine operates at about 300,000 instructions per second. About 40% of the time is being taken by the Universities, 25% by the Rutherford Laboratory, 15% by the Atlas Laboratory itself, 15% by Harwell and 5% by Government laboratories. Work is being done for 25 to 30 Universities who between them have requested time for just under 350 different projects. The forecast of demand is such that we shall need to schedule the machine for 100 hours per week from October 1965 and for 140 hours (the maximum possible) from some time between April and June of 1966. This pressure puts a premium on efficiency - in operation of the machine, in the Supervisor and compiler programs, and in the working programs written by the users.

A FORTHCOMING LECTURE SERIES

Dr. Stafford, Head from High Energy Physics Division, wishes to make the following advance announcement:-

A series of lectures aimed at non nuclear physicists will be started in October. They will talk about experiments and their significance as they are completed on Nimrod.

The lectures will be held at fortnightly intervals and the detailed programme will be announced later. Lectures which have already been provisionally arranged will run until February, 1966.

THE Accelerator WORLD

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

"Atomo e Industria" reported from Italy on 15 June that the "Steering Council of the National Nuclear Physics Institute" had considered the possibility of building a 10 GeV proton synchrotron in Italy. A committee charged with the examination of the proposal should report by 31 July.

John Davy reported in "The Observer" on 8 August that the USAEC have had 110 proposals for the site of the 200 GeV machine including ones from Gila River Indian Community Council, Arizona; the Playground Chamber of Commerce, Florida and Luxury Homes Incorporated, Indiana.

USA Visit

At the end of May, Dr. Bob Churchhouse, Bart Fossey and myself visited the USA for about a month, the main purpose of the visit being to attend the International Federation of Information Processing Conference (IFIP 65) held this year at the New York Hilton. The Conference takes place every three years and papers cover the whole spectrum of interest in the computer world.

During the week of the Conference, eight streams of papers were given in parallel so that, even between the three of us, less than half of the papers were covered. The Conference itself was slightly disappointing with a number of papers being either out-of-date or having a minimum of new ideas. In addition the enormous size (about 5000 people attended) tended to make it difficult to contact people of similar interests. The great interest in non-numerical applications of computers that has developed over the last few years was mirrored by the large number and variety of papers devoted to topics in this field; in particular the theory of computer languages and design of compilers.

After the Conference, we visited several manufacturers and university computer laboratories. The interest in time sharing systems, where many users share the computer using remote consoles, was evident everywhere. The Project MAC system at M.I.T. is probably the most advanced with 120 consoles spread around the campus and access also available from Stanford University on the West Coast. Some faculty members even had consoles at home although their wives did not always approve. This new form of programming, where a man-machine conversation is established, has opened computers to a lot of new applications.

At M.I.T. an impressive information retrieval system has been set up whereby users can interrogate the system, modifying their questions according to responses, until the sources of the relevant information are discovered. We were able to try the system out and I arrived at the conclusion that nobody had ever used any paper of mine as a reference. In addition when things are not going so well, a Machine Psychiatrist Program is available to give comforting replies to any question you input through your console!

We were also able to see the new ranges of computers being produced by I.B.M. and C.D.C. coming off the assembly lines at Poughkeepsie and Minneapolis. Computer components have become much smaller in the new ranges due to automated techniques in the manufacture of core stores and packages, so much so that a computer several times more powerful than Atlas could be housed with ease in the present Atlas building.

On the whole the visit was very informative and we all feel rather disappointed that the next IFIP Conference in 1968 will be no further away than Edinburgh.

Bob Hopgood.

STAFF MEETING

Mr.J.F.Hosie, Director of the Nuclear Physics Division, and the Astronomy, Space and Radio Division at the SRC London Office, addressed a Staff Meeting in the Lecture Theatre on 20 July.

Before introducing Mr.Hosie, Dr.Pickavance summarised the progress and the decisions that had been made since the last Staff Meeting. The alternator repairs will take a little longer than was hoped and the resumption of normal running is now scheduled for late October. The K_2^0 experiment and two bubble chamber experiments are to be done at CERN. 93% reliability has been achieved during recent 2 GeV operation of Nimrod, and the life expectancy of the vacuum vessels has been revised to 9 years on the basis of dosimetry data.

The British National Hydrogen Bubble Chamber has completed its programme at CERN. It will be shipped back to this country in October, following lighting and magnetic field tests. The Helium Bubble Chamber should be operational by October, 1966.

A proposal has been submitted to the SRC for more computing facilities at the Rutherford Laboratory, since Orion and our share of Atlas are already overloaded.

Mr.Hosie's talk was devoted to the organisation and financing of Government sponsored Civil Science, and in particular to the Nuclear Physics Division of SRC. The present organisation stems from the adoption of most of the proposals of the Trend Committee. This recommended changes to the then existing arrangements to secure more effective usage of the Civil Science budget which had quadrupled in the last decade.

Funds now come in the form of grants-in-aid out of the Department of Education and Science Vote. The Chairman of SRC, Sir Harry Melville (the only full time Research Council Chairman), has accounting officer responsibilities to Parliament analogous to those of a Permanent Secretary. Out of a total (1965-66) Civil Science budget of £52½ million, the SRC is responsible for £28½ million. £13.8 million of this is for nuclear physics: £9.45 million for the Rutherford and Daresbury Laboratories, £3 million for CERN and the rest for grants to Universities. The disbursement of these funds is on the advice of the Nuclear Physics Board which in practice has considerable executive authority.

It was decided at the June Meeting of the CERN Council that the U.K. should support the storage ring project at CERN. This commits this country to an expenditure of £0.7 million for the first year and £1.5 million for each of the following four. A corresponding cutback in home nuclear physics will have to be made, the precise areas in which this will be done being an agonising decision for the Nuclear Physics Board (which advocated support for the storage rings). In view of the present economic situation, the growth rate of nuclear physics expenditure (in real money terms) will almost cer certainly fall short of what the subject needs. Any commitment on a 300 GeV accelerator must inevitably be put off for at least a few years.

Mr.Hosie then turned to a detailed consideration of delegation of powers and policy making within SRC and presented a dismaying picture of the present difficulties at London Office. These stem from shortage of staff and the continuing lack of detailed directives from the Treasury. Examples of financial authorisation powers are £100,000 by the Council itself, £25,000 by Mr.Hosie and £5,000 by Dr.Pickavance, though it is not clear whether these are for capital commitments or current expenditure. Forward financial planning is hampered by an unfilled PSO post, and further difficulties will result from the impending return of Dr.Clarke, who is Head of the Nuclear Physics Division, to the AEA.

There then followed almost an hour of questions and discussion. In this respect, as in others, the meeting was one of the best for years and there was no hesitation on the part of the audience in taking up and developing many of the points Mr.Hosie had introduced. Much of the discussion, as might be expected, was centred on money matters and whether it would be possible to get more by having more than one financial channel for nuclear physics as in pre-Trend days, and as in the USA today. The

majority feeling, however, was that any advantages in such a multiple system would be offset by increased difficulties in scientific policy making. The new Council for Scientific Policy, under the chairmanship of Sir Harrie Massey, had better terms of reference than the old ACSP and, being the sole advisory body to the source of funds (the Secretary of State for Education and Science) should be able to ensure that nuclear physics gets it fair slice of the cake. A number of members of the audience expressed doubts as to whether co-ordination of policy could work in practice, because of the difficulties of deciding objectively the relative importance of growth in separate disciplines. (It was not clear whether these doubters were advocating scientific anarchy.)

In conclusion, the discussion turned briefly to a point raised previously by Mr. Hosie. This was that London Office was, despite its difficulties, doing its best to assist the six SRC establishments in every way. He hoped that there would never by an "us and them" attitude within SRC. Your reporter feels that, if there are others like Mr. Hosie at London Office, there need by no worry on that score.

Letters to the Editor

(Pseudonyms are accepted provided the author's name is known to the Editor.)

Sir,

I find the short paragraph at the bottom of Page 10 of July's Orbit fascinating. Who said it and in what context ?

Is it possible for you, or some of your readers, to say why "the very idea of spatial structure much smaller than protons is meaningless" I find difficulty in putting limits to the infinitely small (or large for that matter) or is someone pulling my leg ?

E. G. Higgins

The paragraph referred to was taken from the Guest Leader, entitled "The Final Step in Particle Physics", in the July issue of Science Journal. The author is Otto Frisch, Professor of Natural Philosophy of the University of Cambridge. (This credit was inadvertently omitted in our July issue). Another interesting quote from the Guest Leader is as follows:

" ... a working party under the chairmanship of Professor D. H. Wilkinson has shown that our expenditure on high energy physics must increase by about 19% per year if the subject is to be properly developed ... Anything substantially less than an annual expansion of 15% in research effort would mean that we would soon be left behind by other European countries"

The same issue of Science Journal also contains an article on the CERN intersecting storage rings by M. J. Pentz entitled "Storage Rings for Particle Physics".

Perhaps some of our high energy physicists would like to comment on "spatial structure much smaller than protons"? Maybe it is "meaningless" because it cannot be observed and we can only build meaningful theories on the basis of observation ?

Ed.

Sir,

I must object in the strongest possible terms to the recently announced increases in canteen food prices. My total daily expenditure has thereby been increased from 2/7 to 3/0, which represents a rise of more than 16 per cent in the cost of living.

Even our Labour Government can do better than this.

Pete Martin.

Sir,

It was learned at the recent Staff Meeting, that in order to find the funds for British participation in the CERN storage ring project, it would be necessary to make a corresponding cut in domestic nuclear physics expenditure.

When the Nuclear Physics Board comes to making the agonising decision as to where to make the cuts, I would suggest that the axe should fall relatively lightly on the low energy activities. There are two reasons for this. Firstly since the low energy work represents the smaller part of the total expenditure, a cut of a given magnitude will be the more crippling. Secondly it is the high energy, strange particle, physicists who will eventually benefit from the storage rings and it therefore seems right that they should make the necessary sacrifices.

A.P. Banford.

Quotes

"Transfer of information is an inseparable part of research and development. All those concerned with research and development - individual scientists and engineers, industrial academic research establishments, technical societies, Government agencies - must accept responsibility for the transfer of information in the same degree and spirit that they must accept responsibility for research and development itself."

"Science, Government and Information"
A Report of the (USA) President's Science Advisory Committee, Jan. 63.

"The scientist as the visionary bungler stubbing his toe over the most obvious facts of life certainly has his counterpart in everyday experience. Indeed the very fact of asking a lot of questions is sure to produce a lot of wrong answers. But it is the virtue of science over the long run to put these wrong answers to the test of reality and relegate them to the junk heap of human experience".

Glenn T. Seaborg
Chairman, U.S.A.E.C.

"Administrative machinery exists in these circumstances (research laboratories) for the needs of the scientific work, and is otherwise meaningless or indeed dangerous ..."

Lord Snow in the House of Lords debate on the Science and Technology Bill, 9 March, 1965.

Extracts from "Science and Society", an address given by Professor Bernadini at the Dedication of the ZGS at Argonne, USA.

"It is a general fact that in our historical period, the activities of pure and applied research are doubling every decade, while all other cultural and practical activities, from fine arts to agriculture and industrial factories, are doubling every 40 years."

"There were about 1,000 scientific periodicals in 1850, 10,000 in 1900 and 100,000 today: too many, I feel, even for a 'Scientific Era'."

"Problems have been scientifically and carefully studied and the corresponding solutions considered, but, in almost all cases, for an intricate net of reasons the scientists have so far mainly played the role of 'experts': a humiliating role free from any direct responsibility."

"It is not through the wonders of the most striking inventions: it is not through the experts (those grey eminences of the Scientific Era), but through education and schools, from the elementary to the colleges that the influence of science on modern society should be, and could be, tremendously increased in a few decades."

"The time can't be far off now when one changes one's computer as often as one changes one's car."

Guardian, 5 June.

Outside Hours

My Experiences With Models

MIKE AUDUS

"Is Master Audus at home, ma-am ?"
"Master Audus ?" queried my wife guardedly.
"We've found his aeroplane", announced the burly policeman.
"Oh, I see, well actually it belongs to my husband!"

Like many people our local "bobby" regarded model aeroplanes as being the exclusive property of the schoolboy and departed looking faintly disturbed at this unexpected turn of events.

Kids stuff ? It depends on your viewpoint I suppose. What really matters is that it is a fascinating hobby. Of course it needs a little patience to build a model and usually a certain amount of "tinkering with the works" is necessary before it will fly properly but the difficulties are not great and if the satisfaction of building a working model is not enough for you, then you can take it down to the field and fly it to your hearts content as often as your wife will let you off from gardening.

"What was that ?" If my model was radio controlled how came I lost it ?" Well accidents do happen sometimes you know.

This particular accident followed a series of crashes in which three of my friends wrecked their models on the same evening. A few nights later, I was the only one amongst us with a serviceable model. There was a fair wind blowing but with several enthusiasts sitting around with itching fingers, clearly I must fly! I filled the tank, flicked over the propeller and took off. At first all went well. I had made various adjustments after several less satisfactory outings earlier that season and my model was now going reasonably well. I was enjoying myself. By now it was sixty feet up. The wind was stronger up there and the tiny engine hadn't the power to make headway against it. Time for a quick spiral turn to lose some height, I thought. Then things began to go wrong. I got halfway round and then couldn't get the nose to point back into the wind. Before I realised what was happening it was off downwind, over the railway and out of range of my transmitter.

I followed in hot pursuit in the car but to no avail and returned home with mixed feelings. Although at last it really had flown well, that hardly compensated for the loss of my engine and radio. I comforted myself with the thought that others had lost models and had them returned later - maybe I would be lucky.

When finally I did recover this model, I found it had gone two miles before coming down at the edge of a pond. I mended a few tears in the covering, fitted a new battery and I was flying again. Of course not all modelling stories end so well - sometimes you call for a brush to sweep away a crumpled pile of balsawood lying in the grass!

Radio controlled modelling has recently enjoyed

The bi-plane is a scaled model of a Tiger Moth; the larger plane is a construction kit model typical of many small commercial aircraft but not based on any particular one. It was the larger model that went astray.

The author operating the transmitter. Ground to air range is just over half a mile. The joy-stick gives control of pitch and direction and other controls adjust the plane motor speed.

a boom in this country with an ever growing following. The majority, I believe, fly rather simple models like mine with only one or two controls. It isn't very expensive, especially if you build your own equipment, and for those so inclined, a number of well tried "do it yourself" kits are available.

You can of course progress to much more ambitious projects - models on which you can control almost everything and perform most spectacular aerobatic manoeuvres, always assuming you have the necessary piloting skill.

A particular craze at present is pylon racing, in which models race on a circuit marked by two large poles, say 500 yards apart. It calls for fine judgement to guide a small fast model as close as you dare to a pole which is a few hundred yards away and spills are not exactly rare. (Models, incidently, may reach 50 mph in these events.)

Some mention should also be made of those who prefer scale models. Some truly beautiful examples appear from time to time, especially in various contests which are organised up and down the country. Older aircraft are usually the most popular such as biplane fighters of the Great War era and of course the famous Tiger Moth. One well known British modeller recently produced a ten foot wing span scale version of the Shackleton bomber complete with four working engines. No mean feat that when you consider some of the problems, balancing the four engine thrusts for instance.

Two rather unusual uses for radio controlled model aircraft recently came to my notice. One was a modeller who used his aeroplane to take aerial photographs and the other concerned a laboratory in America which used a model aeroplane packed with meterological instruments to help them study certain weather problems.

Although my particular interest lies in aircraft there are also the boat men who build everything from Tugs to Battleships and from fast launches to yachts. Many regattas are organised annually for the competitively minded enthusiasts.

Finally some folk build cars and other types of land vehicles; tanks and tractors are quite popular I believe. Vehicles do have the advantage of being all weather models and are just the things for winter evenings - which reminds me - somewhere my daughter has a plastic motor car which might just be large enough to take a radio and an electric motor - now where's that toybox .....

" ... the image of hunting is well on the way to becoming absurd: surburban NIMROD in pursuit of status".

Maurice Richardson reviewing "Against Hunting"
Observer, 11 July.

The Rutherford and Atlas Laboratories Recreational Society

The Recreational Society was formally launched at a meeting in the lecture theatre on 30 July. Attendance at the meeting was somewhat disappointing, but the sixty or so people who did attend were clearly prepared to support the venture.

A brief report on the "story so far" was given, outlining the history of the early negotiations, the tiresome delays, the present position and future outlook for the Society together with an outline of the type of facilities the Society can offer immediately. It was stressed that the activities are bound to be limited in the first year of operation, if only for financial reasons, and the facilities available are more likely to suit those activities requiring modest financial support. The present accomodation is most useful for lunchtime activities and it is hoped to organise social activities in the future (although these will have to be on a small scale initially).

Discussion at the meeting centred on two major points; our relationship with AERE Recreational Association and fund raising techniques. Reference was made to the assurance, given by the Chairman of AERE Association at the open meeting last year, that setting up our own Society will in no way prejudice our membership of the AERE Association and a request was made that this assurance be given more publicity. A recent letter from the deputy chairman of AERE Association confirms that membership will continue to be available to members at the Rutherford and Atlas Laboratories, and it is hoped that this will dispel any fears that remain on this point.

Various techniques for raising funds were discussed, ranging from licensed bar facilities to profits from vending machines. It was felt that the present accommodation, Building R14, was not suitable for installing bar facilities but the committee is obviously prepared to consider these matters urgently.

Several nominations for committee members were received at the meeting, and the following officers and committee members were elected:

R C Hazell	-	Chairman
R Hecken	-	Vice Chairman
Miss J Towers	-	Hon. Gen. Secretary
E Newbold	-	Hon. Treasurer
E W Clark	-	Committee Members
F Harden		
F R Hopgood		
B Briscoe		
T Harper		
Mrs. M Gilbert		

A draft constitution was presented at the meeting, and after accepting a motion that the Atlas Laboratory be included in the title of the Society this constitution was adopted by the meeting. Copies of an early form of this constitution are still posted on the various notice boards around the Laboratory and will soon be replaced by an up to date version.

Membership of the Society already stands at well over 100 - an encouraging start, but it is hoped that this number will be considerably increased as the Society becomes more active.

Matters now under consideration by the committee include fund raising and the collection of subscriptions, support for the newly emerged table-tennis club, fitting out and decoration of building R14, and consideration of the provision of more general facilities such as a putting green and tennis courts which members have requested.

Spectacular results are not expected at this early stage, but it is hoped that the Society will gather momentum in the next few months, a healthy level of activity during its first year of life, and then move on to a more ambitious programme in the future. It is not the intention to compete with the facilities already available, but rather to supplement them. The committee have undertaken to meet where possible any reasonable demand for recreational and social facilities at the Rutherford and Atlas Laboratories.

R.C.H.

Orbiting Around

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

Overland to...

Setting out on 7 September on what could almost be another "Lost Horizon" adventure are five intrepid travellers from the Rutherford Laboratory and AERE.

They are Peter Rowe (PLA), Ron Baldry (AERE from R36), Graham Olive (Metallurgy, AERE) and Don Owen (RRD AERE), with his wife Jennie. Method of transport - Land Rover. Destination, well not quite so easy to answer but one hears murmurs of India and Ceylon but let us just say South East Asia. Don and Jennie Owen intend finishing up in Australia. The rest of the party are very unsure but by Christmas !!! There is also talk of climbing in Turkey, maybe a look at the Himalayas. ORBIT wishes them success on their travels and hopes to report progress in later issues.

Cup goes to Nimrod

The NIMROD Cricket team has won the Vice President's Cup in the Evening League cricket competition.

Their quarter final match on the 4 August was a close affair against Design Office. Having lost the toss NIMROD were put into bat and were all out with only 64 runs on the board. Mick Jefferies provided the one bright spot in the innings with a very useful score of 20, which included a couple of sixes, and Reg Youthed was the only other batsman to reach double figures with a total of 11. Design Office in reply were kept pinned down by some very good bowling by Dominic Medar, Reg Youthed and Johnny Moir and could only reach 59 runs at the close of the game.

In the semi-final NIMROD met Chem.Eng. who had in fact beaten them earlier in the season. Spurred on by this memory, the NIMROD team soon had Chem.Eng. in trouble. Some good bowling by Reg Youthed (3-17) Dominic Medar (2-14) and B.Goodenough (3-13) had them all out for 63. NIMROD, in reply, easily passed this total with Ray Smith scoring 35 n.o., Barry Briscoe 11 and Ken Gregory 8.

The final of the Vice President's Cup was played on 16 August between NIMROD and RRD. It turned out to be one of the best finals yet.

RRD won the toss and elected to bat first. With Crick and Ruffle at the wicket the runs came quickly until Ruffle went for 32. Crick was then joined at the wicket by Kilbourne and these two continued piling on the agony with a very useful partnership before Crick was out for 26. Kilbourne carried his bat for 25. RRD reached a total of 103 runs at the end of eighteen overs, which seemed almost beyond reach. Ray Smith had put up a very good show as wicket keeper taking two very fine catches. Mick Woods took a splendid catch on the boundary. There was also some very fine bowling by Reg Youthed, Dominic Medar and Ken Gregory who did well to keep the score down to 103.

NIMROD got off to a very shaky start losing Ray Smith (who is normally the mainstay of the team) for only 2 runs. Barry Briscoe and Ken Gregory soon altered this situation however and began flaying the bowling all over the field. Barry eventually went for 42 and Ken for 30 after a partnership of 67. The remaining runs were knocked off by Mick Jefferies, Reg Youthed and Mick Woods and NIMROD won with almost two overs to spare.

The Cup was presented to the winning team by Dr.Goodway who also saw to it that the Cup was filled in the Social Club afterwards.

B.Goodenough

Atlas win Division 2

The Atlas Laboratory team continued their run of successes to win Division II of the Evening League cricket competition.

However, the law of average started working again and in their play off for the Cup, they were defeated by the Industrial Chemistry team by 16 runs. What happened to their secret weapon mentioned in the last issue of ORBIT ? Did they turn out in "whites" for the big occasion ?

Table Tennis RUTHERFORD LAB. TABLE TENNIS CLUB

At a lunchtime meeting on 4 August the Laboratory Table Tennis Club was put on a formal footing. Gordon Scott (Reproduction) was elected Chairman, Keith Sinclair (R9 Workshop) Secretary, and Terry Crago (R2 Workshop) Treasurer. Membership will be open to all members of the Recreational Society. The annual subscription was set at 6/- to cover the cost of bats, balls and nets and it should be stressed that it is necessary to join the club in order to use the table tennis facilities.

A table is set up in R14 and will be in use every lunchtime and on several evenings each week. It is hoped to enter two teams in the Didcot and District League (possibly one in each Division). Enthusiasm is high and this looks like being the first club within the Recreational Society to really get off the ground.

ATLAS LAB. TABLE TENNIS CLUB

The seeds of the club were sown early in the year when a few enthusiasts began slipping away at lunch times to play on the Ridgeway table. The number wanting to play rapidly grew and it soon became obvious that we required facilities of our own. The two problems we had to solve were, naturally, finding a suitable room to play in and buying a table for a price we could afford. A solution to the first problem was found at the end of March when the Director of the Laboratory kindly granted us permission to use the large Conference Room for one lunch time per week (we chose Mondays) and any evenings. The second problem proved more frustrating. Exchange & Mart only advertise tables which have just been sold! However, mid-July saw the advent of a second-hand table and the club was promptly launched (without champagne - we still had to pay for the table).

The club membership now stands at 14 and, by means of subscriptions and playing fees, a positive (just !) £sd balance has already been obtained. This will enable us to buy further club equipment. The Club has applied to enter one team in Division II of the Didcot and District Table Tennis Association League.

Donald B. Russell

Gliding Club

A small group of enthusiasts are interested in forming a gliding club, as a section of the Rutherford Laboratory Rec. Society. Interested persons with or without experience are asked to get in touch with Eric Kirby, Bldg. R18.

Comings and Goings

Dr P K Kabir joins Theoretical Studies Group: M R Jane joins Counter Group (visiting); Mrs J O Lay joins Atlas Operations Group: Mrs J D B Woodcock joins General Administration.

M H J Wyard, J T Morgan, R C Steed, A J Foster, T G Weatherburn and D A Woodley join Central Engineering Group.

S Wallace, A Gordon and W Kolodko join Nimrod Machine Engineering Group; E Bevan joins Nimrod HEP Engineering Group; J E A Martin joins PLA Engineering Group.

Dr N H Lipman, Dr W Newport and Dr P R Williams have accepted permanent appointments.

Miss M K Taylor, Miss J Gladwin, Mrs R A Joseland, M A Badcock, K T Buck, S Randall and R W Thompson have left us.

Congratulations to:

Ian Hurdel on his marriage to Jennifer Wells on 7 August. Jennie and Ian most heartily thank all those who contributed so generously to their wedding gift.

Sally Donaldson and Peter Sarll (both of Administration Division) on their marriage on 19 August.

Terry Harper, Nimrod Machine Physics Group, on his engagement to Carole Lapthorn on 1 August.

Suggestion Awards

At the twenty-ninth meeting of the Rutherford Laboratory Suggestion Awards Committee held on Wednesday 18 August 1965, the following awards were made.

Award of £5 to D A Hutchings whose proposed re-design of curved coils had been successfully adopted.

£2 to F Burden whose proposed method of preventing unauthorised entry into R9 had been adopted.

£2 to D A H Longstaffe whose suggestion to use narrow necked containers for mercury had been adopted.

£2 to J C Sutherland whose suggestion had drawn attention to a safety hazard, which had now been eliminated.

£2 to E Angell whose suggestion had drawn attention to a safety hazard in R6 which would be removed.

£2 to T Stuart whose suggestion had provided a simple, economical solution to the problem of regulating the flow of Helium gas.

£1 10s. 0d. to G Scott whose proposal to facilitate entry into R25 car park would be adopted.

Encouragement awards were made as follows

£1 10s. 0d. to A E Richards and £1 each to J E Purling and J L Timmis.

B Briscoe Secretary.

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