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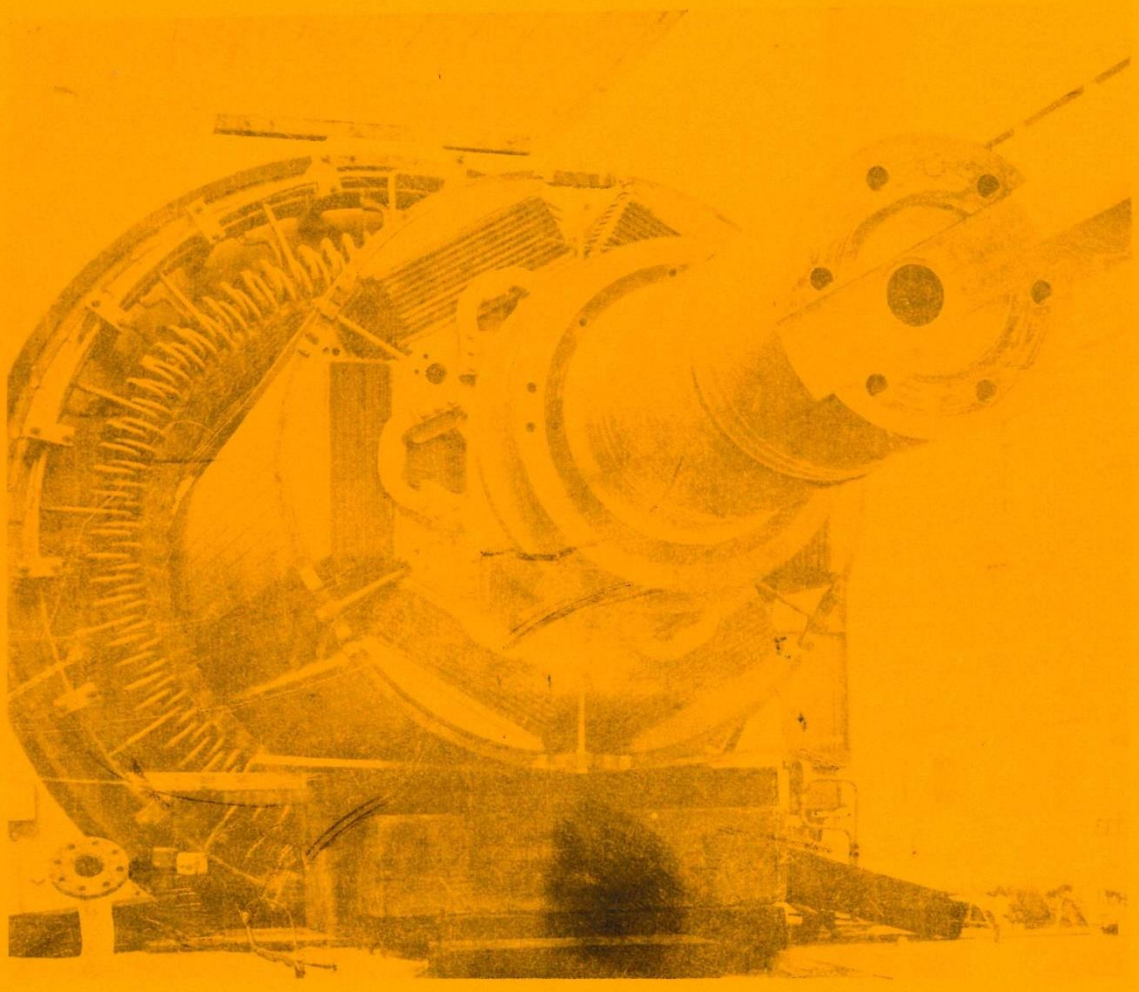

Cover Photograph:
The first repaired rotor goes back.

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Editorial

Given an increasing demand for scientists an an increasing supply, we will move inevitably towards the "every man a scientist" state discussed by Lord Bowden and others. Of course we know something will prevent this from happening and it may simply be that the demand for scientists will cut off the supply at the roots by consuming all the graduates who ought to be teaching science in the schools. The backbone of the scientific community of 1984 is at this moment a horde of untidy school children obsessed with home-made transistor radios. But their emergence as an effective scientific force is crucially dependent on those who teach and inspire them. Unfortunately the school-teaching profession can compete only weakly against industry for a share of the available graduates.

Sir Willis Jackson's Committee on Manpower Resources for Science and Technology has recently recommended "that ways should be found to use imaginative and resourceful individuals with practical experience in research and development establishments and industry, to widen the scope of science and mathematics teaching in the schools and to demonstrate the challenge of careers in applied science and technology." Commenting on this "Nature" lays a major responsibility for acting upon this recommendation on the Department of Education and Science. But in the end we know that the responsibility is on places like the Rutherford Laboratory.

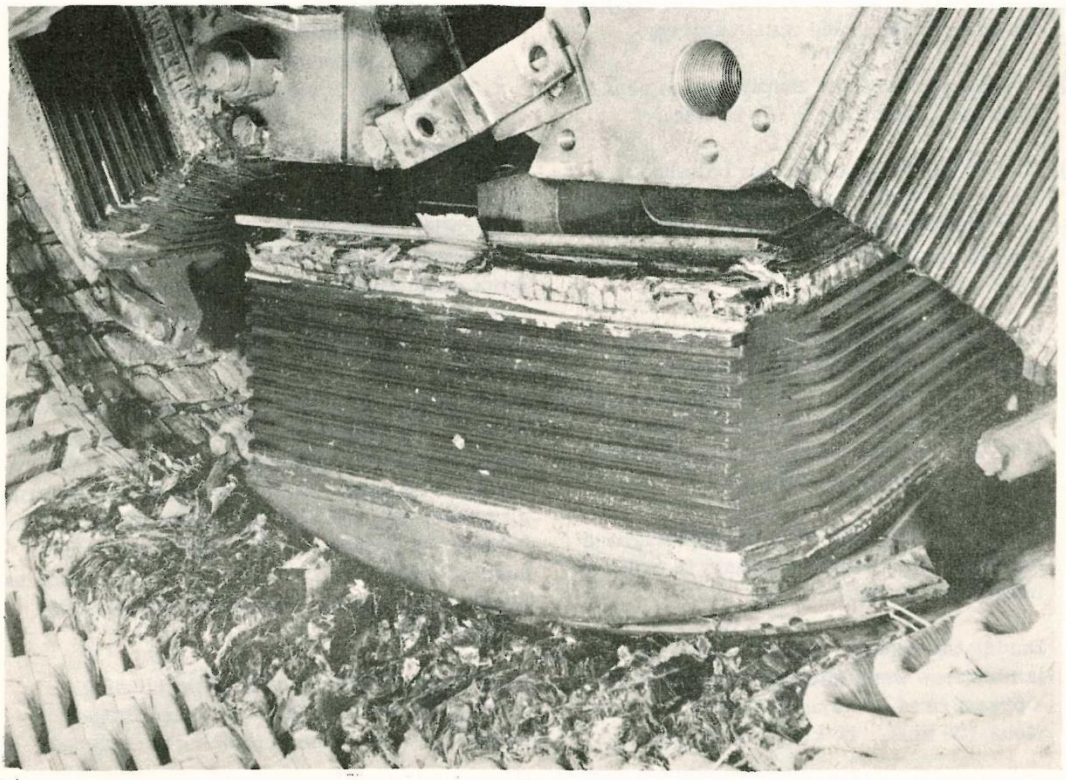
Report on the Nimrod Alternator

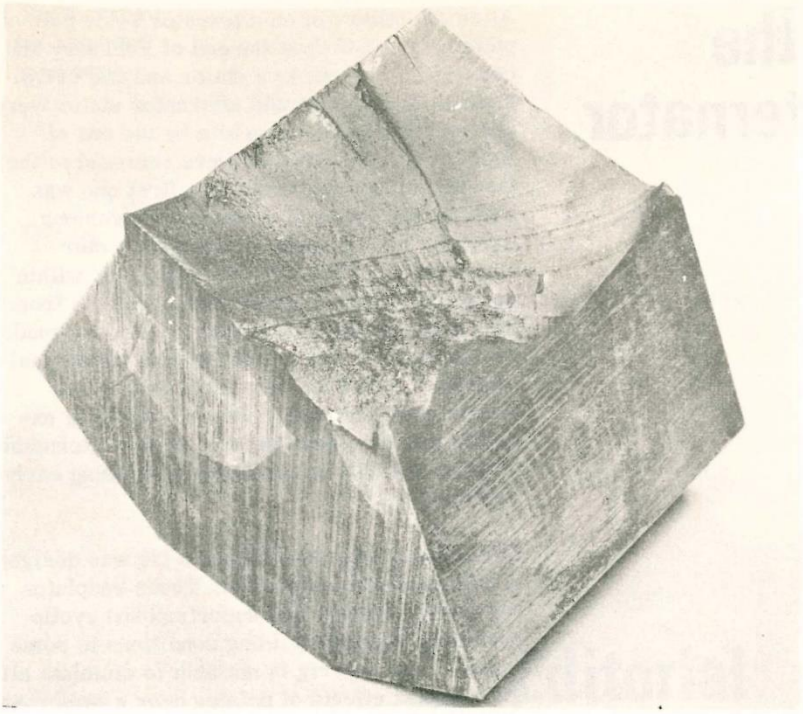
H C Brooks
T R Clements
N E C Garnsey

After the failure of an alternator rotor pole end plate (Figs. 1 & 2) at the end of February and consequent damage to a stator and two drive motors, the motors and alternator stator were all repaired and back on site by the end of September. Both rotors were returned to the manufacturer's works and the first one was back on site by the first week of November (cover). Re-assembly of the first motor-alternator-flywheel set was completed within two weeks. Strain gauge measurements from the endplates were taken and the set was made available for 7 GeV pulsing at half the normal repetition rate from November 28th. The second rotor arrived in January and it is expected that the complete twin motor-alternator-flywheel set will be available for pulsing early in February.

Immediately after the failure a rig was designed to test specimen endplates. These endplates had steady loading with superimposed cyclic loading to simulate pulsing conditions to some extent. The test rig is not able to simulate all the complex effects of pulsing over a wide range of conditions, but it gives, nevertheless, valuable information on endplate material and profiles. This rig operates at a frequency which simulates 20 years normal pulsing in as many days.

Fig. 1. Damage to the rotor and stator.





As a result of a wide variety of tests, discussions with the manufacturer, Lloyds Register of Shipping, and other specialists, the endplate design was reviewed and the following changes agreed.

(1) The endplates are now EN25 steel forgings instead of high grade steel castings.

(2) The thickness of the endplates has been increased from five to six inches.

(3) The endplate faces are now polished in order to provide a good surface for future non-destructive tests, and also to remove machining marks which are potential stress raisers.

(4) It appears that the failure in February arose from fretting fatigue between the key and the endplate, the cracks originating from the region near the top of the key. (Fig.4). A relief has been incorporated in the new endplates (Fig. 5).

(5) It was also considered to be advantageous to coat the keys with phosphate in order to inhibit corrosion.

(6) During the rebuild of both rotors, the laminations were initially compacted with a pressure of 330 tons instead of the previous 120 tons. To keep the laminations as compact as possible the pole rivet bars, passing from endplate to endplate through the laminations, are now made from high tensile steel and each has been tightened to 300 lb. ft.

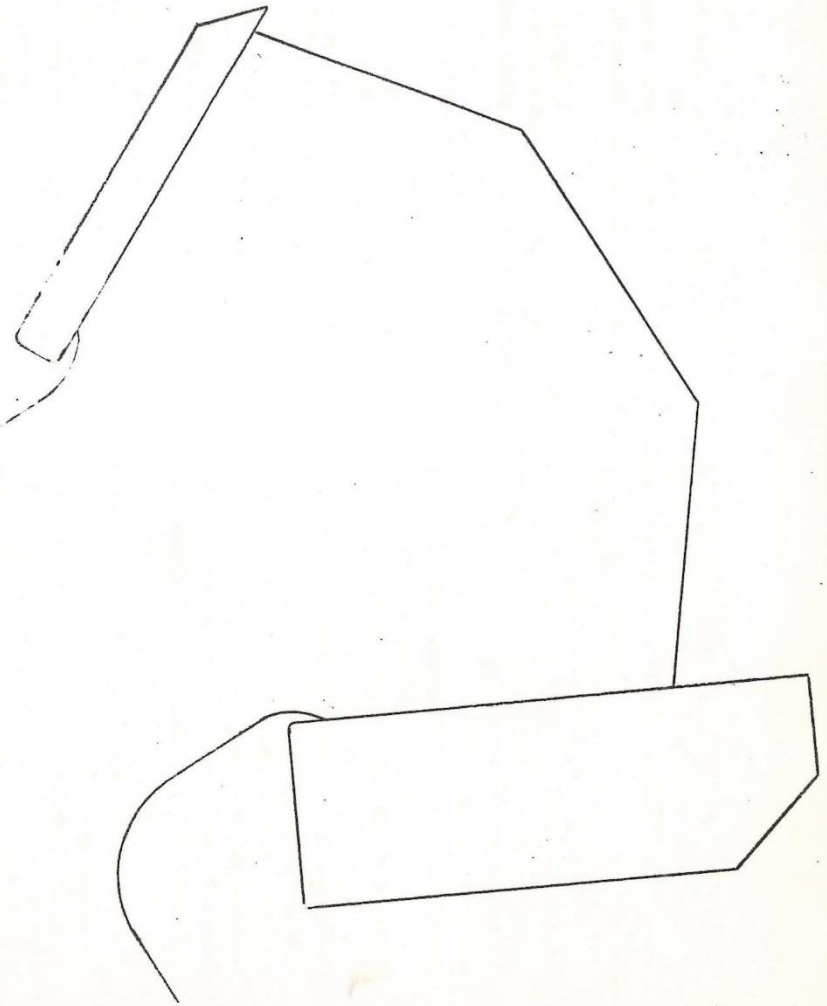
(7) To permit easier access to the pole endplate for visual and ultrasonic inspections the pole coil connections have been reorientated to leave the dovetail area clear. These new connections can be seen in the cover photograph.

At all stages of manufacture the endplates were rigorously inspected by a variety of non-destructive tests. Test pieces were removed from each forging and the mechanical properties ascertained. The assembled rotor was mechanically balanced, then subjected to a 15% overspeed test.

Tests so far do not indicate excessive stresses in the rotor assembly, but the results are still being evaluated. Additional tests and measurements to be made on the completed twin-motor-alternator set will include further strain gauge checks and photo elastic measurements under running conditions. Tests will also be made to try to determine the movement of pole keys when pulsing.

Meanwhile the desirability of purchasing a spare salient pole rotor with poles forged integrally with the body is being considered.


E.W.E



The Variable Energy Cyclotron -First Beam

J D Lawson

Excitement, pride, and (not least) relief were much in evidence in the V.E.C. control room on the afternoon of December 15th, as champion knob-twiddler Mike Russell surely and swiftly brought our first beam out to full radius, less than 24 hours after our first switch-on.

This is an important milestone in our enterprise, which will ultimately provide for chemists and metallurgists at Harwell a wide choice of particle beams of different energy. Although many tasks lie ahead, such as beam extraction, and the harmonic acceleration of heavy ions, we feel that with a beam to play with we are now in business.

The first beam consisted of 23 MeV H_2^+ ions. During the first week of operation we got the feel of the machine, and filled over 50 pages of the Experimenters' Log Book with graphs and calculations. The machine behaviour is in excellent agreement with theory, except in a small region near the centre where an elusive gremlin has yet to be exorcised.

An attempt on the afternoon of the 23rd to have a "quick bash" at achieving the maximum proton energy of 50 MeV failed. At going home time (with the beam two thirds of the way out in radius) a strange fault developed, the beam totally disappeared for no apparent reason. Our only theory is that it was the effect of a concerted prayer from the wives!

We started again on January 6th, after a Christmas shutdown, and it was not long before we got our 50 MeV protons. The programme now is to track down our gremlin, and do a careful series of measurements on beam quality, a necessary preliminary to extraction.

Despite the large number of controls, the machine has turned out to be quite simple to operate. Once set up, it just runs steadily.

The cyclotron, though simple in principle, is in practice a bewildering mass of details, each of which must be correct before it works. I think it is the care and thoroughness exercised by all who have worked on the project in ensuring high standards in every detail which has got us off to such an encouraging start. We must not be complacent however; much has still to be accomplished before we can hand over a working installation to our users.

The following letter from William A. Shurcliff, CECU, was printed in "Science" on 5th Nov. 65.

Floating Accelerator - Progress at Last

It has been a pleasure to observe, during the last 6 weeks, increasing interest among policy makers in the proposal that the 200-Gev proton accelerator be located on a large, specially designed, floating platform. Long recognized as offering unique advantages of flexibility of use and economy of construction, the plan has been plagued by questions of safety. Happily, these have been solved, and, according to a report soon to be issued by the Conference of Eastern Coastal Universities (CECU), full-scale consideration of the plan is now warranted.

The report stresses two main design goals: (i) avoidance of extensive use on land and (ii) transferability of the accelerator from one harbor to another at approximately 6-month intervals. Preliminary engineering surveys show that the harbors of New York, Philadelphia, Baltimore, Boston, and Norfolk, Virginia, are almost ideal for the purpose, and West coast harbors could be used after the widening of the Panama Canal is completed.

The accelerator, of strong focusing (alternating gradient) type, would be incorporated in four floating platforms, each about the length and width of a modern 100,000-ton oil tanker. Each would have the form of a quadrant of a circle, and the four units would be joined (by a precision key system and giant hydraulic clamps) to form a single rigid ring. Prior to the clamping operation, ballast tanks in each quadrant would be flooded with sea water to appropriate depth to bring the quadrants to the same level. Thanks to the slight elasticity in the integrated structure, fine-scale alignment of the quadrants of the synchrotron itself can be accomplished by fine adjustment of the water levels in these tanks.

The diameter of the accelerator is relatively small: 400 meters. Correspondingly more powerful magnetic guide fields are provided by 60-kilogauss superconducting magnets of low-inductance design in a multiple-pyramiding arrangement which provides especially tight control of betatron oscillations without significant increase in the period of the synchrotron oscillation (except at injection, when special pentapole magnets of diamagnetic ferrite are superimposed on interphased counter-fields.

Plans for the linac injector are still tentative, but may call for a 1500-foot 1-Gev travelling-wave assembly mounted on two aligned concrete barges to be held by slender, prestressed-concrete equants in rigid tangential orientation.

The ring of 1024 magnets, located in a common circular tunnel running through all four platforms, will be situated 6 meters below the waterline, so that adequate shielding is provided, at no expense, by the surrounding water. A protective screen of nylon netting will probably be mounted some 10 or 20 meters from the quadrants to keep fish away and thus prevent radiation damage to them. The use of such a screen was suggested by the Izaak Walton League.

Although shielding, cooling, and electrical grounding present no problems (thanks to the unlimited amount of sea water available), the provision of adequate power poses problems. Because city electric power, supplied to the accelerator via submarine cables, may be in short supply during the daytime, the accelerator may have to be operated at night only. (If so, tourists could visit the accelerator during the day, and the entrance fees charged might pay a significant fraction of the operating cost.)

When repair work must be performed in the circular tunnel, which would soon become highly radioactive, accelerator engineers would fill the entire tunnel with sea water. Mechanics employing aqualungs or diving suits could then work in complete safety.

A separately constructed central area of the assembly would contain machine shops, special power supplies, a large control room, administrative headquarters, and also a kind of motel (with parking for helicopters rather than cars) for the crew of approximately 1000 engineers and technicians. Recreation facilities would include a movie theatre, squash courts, swimming pools, and a specially stocked fishing pool.

The plan circumvents rivalry from groups in different parts of the country. (The possibility of building the quadrants in smaller units that could pass through the St. Lawrence Seaway

and be assembled in Lake Erie or Lake Michigan has not been ruled out.) Also, four different parts of the country could be given contracts for building the four arc-shaped platforms. (Already, a bid has been received from a Japanese shipbuilding firm experienced in building supertankers.) Since these four quadrants - and the linac structure and the experimental hall structures - could be built simultaneously in different shipyards, as much as 2 years could be saved relative to the time needed to construct a fixed synchrotron.

Only in the last few weeks has the last and thorniest problem been solved: the problem of radiation beamed toward a particular part of the city adjacent to the harbor in question. If an emergent beam were aimed toward a certain portion of the city, persons living there would receive, during a typical month, five or ten times the permissible dose (from muons, which are fundamentally aquatic and can travel freely in water.) The solution is to mount a 5-hp outboard motor tangentially at the outer edge of the platform and keep the motor running continuously, so as to rotate the entire accelerator at the rate of one revolution per week and thus distribute the radiation uniformly along the entire harbor-front. The direction of rotation will be the same as that of the protons in the accelerator, so as to add to their speed; even a slight increase is significant if the particles are already travelling at a speed almost equal to that of light.

Letters to the Editor

(Pseudonyms are accepted provided the author's name is

Sir,

I trust that you yourself have a lively feeling for the beauty of English prose; for in no other modern language can one find such rich resources of vocabulary and syntax. The most complex of thoughts can be expressed without any loss of clarity; the plain language of everyday matters has its own elegance.

You will have shared my dismay when you glanced at some of the notices and circulars we have recently received. Tortuous sentences, obsolete Latin prepositions, double negatives, split infinitives, untidy heaps of adverbs: these are only the more obvious outrages committed against our language.

Since the distribution of pieces of paper is one of the principal activities of the Rutherford Laboratory, we clearly need to find a remedy for this stylistic malaise.

Day-release courses in English language might eventually solve our difficulties, but the problem is urgent. An immediate solution would be to appoint a Translation Officer; his duties would be to advise on punctuation, to cross out "vice" and write "in place of", and generally to transform the contorted ramblings of our administrators into short, plain sentences.

There is a simpler solution. Johnathon Swift would not publish anything he had written unless his chambermaid had first read it, and understood it. But in the Rutherford Laboratory Swift would look in vain for a chambermaid: he would find only a female employee of the Science Research Council, grade GW7, serving under U.K.A.E.A. (Industrial) conditions with a leave entitlement of 7 working hours per completed month of service, and pro rata.

Yours PHILOLOGOS.

Fire Drill For All

by the Fire Committee Secretary.

I had visions of Secretaries jumping into safety nets from the second floor, Division Heads swarming down ropes and firemen gleefully calling for more smoke bombs. These were the thoughts passing through my mind when asked by the Fire Committee to arrange fire drills throughout the Laboratory.

The Fire Committee has for a long time been convinced of the need to carry out regular fire drills but after one rather abortive attempt about a year ago in R. 25, laboratory-wide application of fire drills has been delayed until the proper fire alarm systems were installed in all buildings.

The first drills arranged have been straightforward building evacuation exercises to enable people to recognise the sound of the new alarm bells, find their nearest escape routes and assembly points and for Building Wardens to practice their Fire Drill. The dates of the next series of exercises will not be announced, but each building will be tested approximately once every nine months. We hope to make these exercises as realistic as possible.

The results of the first exercises were very encouraging. This was primarily due to the co-operation of staff and the absence of the "it couldn't happen to me" attitude so common to large establishments. The participation of the AERE Fire Brigade gave a touch of reality to the proceedings. Apart from having made people aware of their own responsibilities in the event of fire, the exercises proved useful in many other ways. They gave us the opportunity to see that the alarm bells were in the most suitable positions and to test them under working conditions. We were also able to see if there were any deficiencies in the escape routes and exits of buildings.

Finally, at the risk of being criticised for preaching, I would ask you to give your full co-operation on future exercises and remember to shut your doors and windows behind you when you leave the building at the sound of the slow-beat bell.

Emergency Calls For

Fire, Security, First Aid } **Dial 2222**

Outside Hours

The Unsocial Climber

Pete Ford

"No - haven't a clue who's coming, or whether they've got ice axes ....."

An air of uncertainty seems to be a part of all preparations; until the time for action arrives. Then it is a matter of rushing off on a Friday night, grabbing a bite to eat and a rucsac and waiting for the transport, which usually turns up at the pre-arranged place, though not so often at the pre-arranged time. Once aboard the waggon, one suffers a shake-down (or is it a shake-up?) period, when rucsacs, people and kit determine the optimum solution to a close packing problem (many good friendships have started this way). And so through the night, with raucous songs and stops for beer and fish and chips.

It is not so bad when your destination is a hut or cottage or, if not raining, when you're camping. But all too often one is turned out half asleep into pouring rain, half a gale and a bog. One sometimes has the privilege of seeing the dawn but most climbers seem to be philistines, and are interested only in finding the tent pegs, the flattest camp site and the warmer lee side of the tent. There are stories of climbers in Britain who arise with the dawn, but I cannot vouch for this, as I am usually deep in my sleeping bag at such an unearthly hour. In the Alps, where long distances and sun softened afternoon snow force one to leave the hut before dawn, one needn't really wake up until after the section which has been reconnoitred the previous day, or until one meets difficulty. One can make up for lost sleep later in the afternoon sun.

Uncertainty appears again, when no one knows what they would like to do, let alone where they would like to go. Conditions are strangely unsuitable for all the projects which were discussed with such enthusiasm earlier in the week. Mention is made of Arvon's climbing shop in Capel, Wendy's cafe in Llanberis, the shop assistants in Fishers' of Keswick etc. Those without previous convictions, and those without the courage of theirs, are eventually coerced, (by misplaced feelings that they ought to do something) into doing something. This may be anything from walking down to Mervyn's tea stall, tramping up one or more of the 13 Welsh three thousanders, or bagging a Monroe or two, (independent Scottish peaks over 3000 ft.) to a very severe rock climb, or hacking steps up many 100s of feet of ice in a gully. In the latter case, it is probable that participants

Weekend party in North Wales.

will get benighted, as good snow and ice conditions only occur in Britain when it gets dark early! Most people attempting this type of thing carry torches, and even thermos flasks of hot coffee or soup, in addition to extra clothing, rope, ice axes etc.

In summer it is tempting to stay out late, but one must be resolute and get back to cook a quick dinner of soup and corned beef mixed with baked beans, chicken noodle soup, followed of course by tinned fruit and Ambrosia creamed rice. And so to the important part of the trip, when everyone congregates in one place. Not much uncertainty here. It can be called the Pen-y-Gwyrd (PYG for us as can't pronounce it) or the Old Dungeon Ghyll (ODG) or even the Sligachan Hotel, the result is the same. A herd of steaming, sweating, smelly climbers jammed in an inadequate space talking or singing at maximum decibels and with minimum signal to noise ratio. Great epics will be heard, of summits achieved, and climbs climbed, and you might be astounded to hear how difficult the outing you made during the day was. There will be a reversion to the great things that are planned for tomorrow and the future. If we are at the PYG there may even be mention of Lockwood's Chimney. "Suitable for a large party of large men, preferably inebriated ... it is customary to do the climb in the worst possible conditions, a wet moonless night being suitable" But this is rather close calling, since if one says too much, one might even become committed to attempting it!

But all good things come to an end, the stroke of closing time eventually expells one into the fresh air, and we are then recompressed into the vehicle for transport back to the campsite, barn or cottage. One sleeps better than the previous night. Some people are up even earlier than the day before, protesting that although they were late to bed, they had got more sleep than the previous night. Coming up in the waggon they had been too scared to sleep except when driving. The approaching return journey encourages an earlier start than that of the previous day. If it is a fairly mixed party, and not too cold, a caravan up one of the easier longer climbs may occur. In cases like this, photographers must be kept on a tight rein or they will be nipping up the adjacent climb to take unflattering photos, while people heave themselves up awkward or strenuous sections. Another good pastime is to make one's way to some place where they serve afternoon tea, a popular pastime in the Peak and Lake Districts. Of course, if you're really desperate you could actually do some real hard climbing.

The Author in Snowdonia

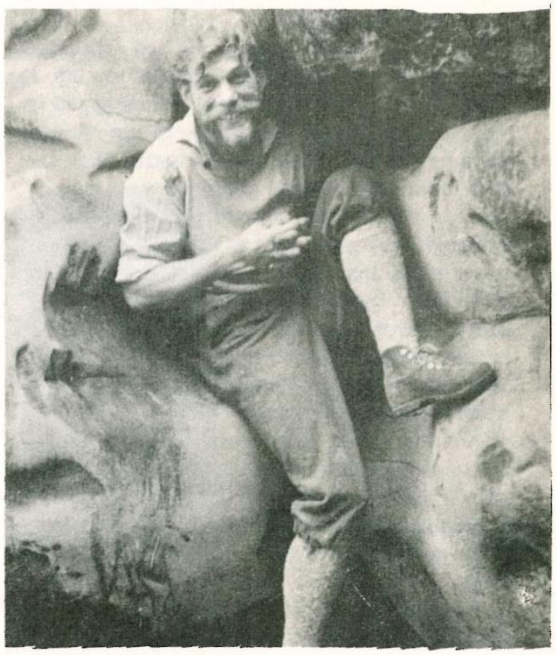
The trip back is much the same as the trip up. After you've waited for everyone to assemble, there is the usual settling down period. The settling up usually occurs in the cafe or pub on the way back. One should be able to sleep better on the way back, as one is physically tired, but some people find this difficult as their nerves are shot by the previous experience of this form of transport, or by the terrors and excesses of the weekend. However, it is not normal for passengers to wear their rock climbing crash hats because they think that the driver is going too fast.

Much of the attraction of mountaineering comes in the contrasts. The escapism of leaving enclosed labs and offices; of cooking for 20 in a kitchen intended for a family of 3 dwarfs; the more isolated hills where you may never see the bar. One meets parties of school children swarming over Snowdon, Helvelyn, Nevis etc., and complete families, with the kids carrying their gear in their own little rucsacs, and perhaps the latest addition, completely oblivious

in its carry-cot attached to a rucsac frame.

In contrast to this, energetic types, go running over the mountain tops (Olympic steeplechaser, John Disley, once held the record for the Welsh three thousanders). Those who dislike walking can take to the habits of their forebears and use their other limbs to swarm up impressive rock faces. With the advent of outcrop climbing, the same rock gymnasts can now climb "impossible" routes without having to walk more than a few hundred yards from the road. This is very convenient, of course, for the even less energetic, who can watch them from their cars. But outcrop climbing sometimes leads to bigger things. The "Top Mountaineer" (Observer) of the 1950's trained on the grit stone edges of the Peak District. This master plumber from Manchester was one of the summit pair who did the first ascent of Kanchenjunga, in the Himalaya. There is also a Voie Brittanique in the Alps with a section named after him which is perhaps the hardest free climbing pitch in the Alps.

Photographers must be kept on a tight rein....



Suitable for large men, preferably inebriated.

Visit To Carnegie

P Bryant
Atlas Laboratory

From 29th November to 17th December Dr.D.J.Howarth (I.C.T.), Dr. R.F.Churchhouse (Atlas Lab.) and I visited the Carnegie Institute of Technology at Pittsburgh. Contrary to popular belief the midday sun does not shine through dark clouds of smoke, in fact the city is reasonably clean considering the steel mills and other industry in the area. Had we not spent the greater part of the day in a windowless office we might well have enjoyed quite pleasant weather.

For our three weeks in the city we were guests of the Institute and stayed at a hotel on Fifth Avenue, one of the main arteries of Pittsburgh. Fifth Avenue was remarkable in that the volume of traffic (including antique trams) was constant at all hours of the day or night.

Carnegie has a strong computing group which is particularly interested in compilers and basic computer software. There is also an engineering support group who are capable of modifying and extending their computer. The computer at present installed is a G21 with a large disk store and with about 16 telephone lines into the machine which can be coupled to 30 or 40 typewriters. In the near future they are getting an IBM 360/67 which will have 100 typewriter lines into the machine and our mission to the college was to discuss some of the problems associated with the system. The problem, stated broadly, is to keep 100 chaps at 100 typewriters continually happy and also to run the machine efficiently. Even on a machine the size of the 360/67 this is quite a difficult problem. We felt that any large computing installation in the future would probably have on-line typewriters attached to it, their great advantage being that the user can get a much better turn around with consequent improvement of efficiency. The system should also ease the problem of finding operators since users will put in their own programs.

The software developed at Carnegie to deal with their present typewriters was quite impressive. They had quite a powerful program editing system called AND which was used extensively by the staff and students for creating and correcting programs. They also had a program for making the typewriter look like a glorified desk calculator. Dr.Cooper, the Assistant Director of the Computation Centre has a special console in his bedroom at home, linked via a telephone to the computer. We first saw it working at about 11.00 p.m. - it surprised us to learn that it is quite normal for all consoles to be active at 4.00 a.m. The college is almost unique in the U.S.A. in preferring ALGOL to FORTRAN language. One wonders how long this state of affairs can continue under the onslaught of IBM. Two of the more frustrating aspects of the system were the difficulty in finding a line into the computer due to the large number of users and the time spent waiting for a completed program to run.

In the Atlas Laboratory we hope to carry out some small scale investigations with on-line typewriters if and when we get a disk and some typewriters. We hope that the experience we gain from these will help us in the design of software for new machines that come along. Certainly we felt that our trip to Carnegie helped us get a foot in the door of on-line computing and opened our eyes to the many problems involved.

Orbiting Around

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

New Years Honours List 1966

We should like to offer our congratulations to the following Staff of the Science Research Council.

C.B.E.	Professor H A Bruck, Astronomer Royal for Scotland.
O.B.E.	P Bowles, Chief Engineer, Rutherford Laboratory.
M.B.E.	A G Wilson, Senior Scientific Assistant, Radio & Space Research Station.
B.E.M.	J.A. Macken, Foreman Instrument Maker (Technical Class II) Rutherford Laboratory.
B.E.M.	B F Offen, Senior Instrument Maker, Royal Observatory South Africa.

Achievement

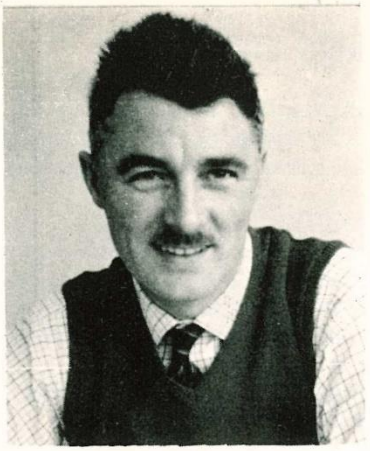
It is always pleasant to record achievements in any field. Scholastic achievements, in particular, are earned by hard work, often demanding a considerable sacrifice of spare time activities over a number of years. Colin Knowles, a member of the V.E.C. Group, is one of the many who have undertaken such a task but he is also one of the much smaller number who have not fallen by the wayside.

He joined the Harwell school in September 1958 and became a member of the Nimrod Injector Group in January 1959, where he worked on the R.F. system for the 15 MeV Linac. After obtaining high marks in the ONC Applied Physics examination he was awarded a place at the Salford Royal Technical College to study for a Dip Tech in Applied Physics starting in September 1961. He was also awarded a Technical State Scholarship and in the following year received a NIRNS award for full time training. In 1965 he took his final examinations with success.

Colin who married last year now lives in Newbury. His interest in cars is partly based on the necessity of keeping an old car roadworthy; apart from this, the pastime that has given him most pleasure is camping and hiking.

Orbiting Around offers congratulations to Colin not only for taking advantage of the opportunities that came his way but for making full use of them.

Journey To Africa



Orbiting Around has, during its first year's existence, had occasion to report on travellers to and from the Americas, the Near and Far East and as far away as Oxford. So it is with great interest that we talked to John Delury before he left with his wife and family for a two and a half year visit to Ghana.

Join joined the Central Engineering Services Group at The Rutherford in 1959 after having been at Harwell. In November 1962 he became a member of the newly formed HEP Engineering Group where he stayed until the end of 1965 when he was granted $2\frac{1}{2}$ years unpaid leave to enable him to take up an appointment in the Commonwealth Africa Aid Scheme.

He is joining the Water Supplies Division of the Ghanaian Public Utilities as Senior Mechanical Engineer in a post which entails travelling over the whole country. The first assignment is to assess the atate of the mechanical plant in the Division and set up planned maintenance. He will be responsible for drafting and instituting training schemes for Ghanaians, necessitating the setting up of workshops and training establishments covering the entire country. This will involve close liasion with the University of Accra. The Director of the Water Supplies Division, who is a Ghanaian, has a staff of 3000 including 75 British employees.

Accra, where the Delury family will be setting up their headquarters, "enjoys" an average temperature of 80^{o} F and a humidity figure of about 80%. John has four children, 3 girls and a boy, ranging in age from 10 to 2. Education he feels, should present few problems since there is the choice of an International School, Church School and a Military School.

He will be doing two tours of fifteen months each with a break for home leave of probably two months, when he will no doubt visit the Rutherford Lab. Always a keen sportsman, he will be particularly missed by the Table Tennis enthusiasts. Apart from his prowess at the net, he has contributed a great deal of time and effort on the organisation of the game in the district.

Our best wishes to John and his wife and family for the future.

Since the above article was written we have received a letter from John saying he and his family arrived safely in Accra. They were moving into a bungalow the day after he wrote, having stayed for a short time in a hotel, at £25 a day. John is due to leave shortly on a familiarisation tour of the country. We hope to provide, via our new Ghanaian correspondent, interesting news from time to time.

P L Hingston,

Atlas Laboratory Table Tennis Club

The club took a little time to find its feet in the league, obtaining only one point from its first five matches. However the next ten matches brought us a further fourteen points so that we are now halfway up the league table. Our most successful player is Bob Hopgood, but six other players have won vital games in matches. We have maintained diplomatic relations with our neighbours at Rutherford by drawing with both their 'A' and 'B' teams, although more recently we lapsed by beating the 'B' by 10-0.

In the Handicap Competition we are through to the quarter finals and are hoping to get our hands on yet another first division side.

The club continues to be very active at Monday lunchtimes and usually on one evening a week.

D.B.Russell.

Comings and Goings

P. L Hingston, J A Lawton and M E McIntyre join Central Engineering Group; A S Howard joins P L A Engineering Group; B Robertson joins Nimrod Machine Engineering Group.

R W Barnard joins HEP Electronics Group; R H Sewell joins Nimrod HEPE Group; Mrs M J Irving joins Nimrod Machine Physics Group; Miss S B Bredmeyer and Mrs P M Howe join General Administration.

Miss J Collett, Mrs B I Howse and D F Parker join Atlas Operations Group.

Dr A Deloff, D E Gray, H G Lewis, D Harvey, P Barton, I Cook, T G Pointer, B A E Smith and A S Howard have left us.

Congratulations to:

Joy Dawson, Administration Division, on her marriage to Alec James on 8 January.

John Crawford, R 9 Workshops, and his wife Doreen on the birth of a daughter on 14 January.

Jim Darius, PLA Workshops, and his wife Maria on the birth of a daughter Sandra Grace, on 15 January.

Record Programmes

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

1 February	William Walton: "Facade Suite"
8 February	Piano Music, played by Roger Williams
15 February	Operatic Highlights
22 February	Irish Folk Music, also songs by "The Seekers"