



orbit

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Cover Photograph: The Headington Morris Men in action at the Ox Roast during the week of the Oxford Conference.



Photographs taken at the Inaugral Session, held at the Oxford College of Technology, Headington on Sunday 19th September.

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Inaugural Address

An abridged version of the address by Lord Bowden, then Minister of State for Science.

Scientific Conferences are becoming a remarkable feature of contemporary life. Some of them seem to be organised by people with little more ambition than to fill a hotel; others are obviously occasions of great importance, very great intellectual excitement and very great interest for everyone. A Conference such as this allows opportunities for people from different countries to meet each other, for people from Dubna for example, to meet people from Oxford, and to meet people from Berkeley. (May I remind you that Berkeley is an American city which derived its name from an eccentric English bishop who was convinced about 200 years ago of the unreality of matter. Dr. Johnson attempted to refute him by stubbing




**OXFORD
INTERNATIONAL CONFERENCE
ON
ELEMENTARY PARTICLES**
**SEPTEMBER
19TH - 24TH
1965**

his toe against a boulder. Even more important it allows opportunities for people from Cambridge to travel, incognito perhaps, to Oxford, and best of all I think, it allows opportunities for men to meet their wives under circumstances normally debarred to them by the pressure of everyday work. They are extremely jolly occasions and I hope you all very much enjoy them.

They become necessary, of course, very largely because of the tremendous rate that scientific papers get written and the complete impossibility of reading them. I did a check, from which I deduced that the average number of writers per paper has grown from $1\frac{1}{2}$ to $2\frac{1}{2}$ in the last ten years, and that the average number of readers in one journal, whose name wild horses would not drag from me, has dropped to 0.6 per paper. Obviously, people who spend enormous sums of money and have dis-

covered fine results, should find an audience somewhere, and this is how they do it.

You will be privileged to visit what is, I am quite sure, by any standards to be judged as one of the greatest Laboratories in the world. One often wonders why we build these places. Of course they are enormous fun, but I have been trying to think of a valid reason for justifying their existence and can only in retrospect think that they satisfy in some mysterious way the spirit of the age, in much the same way that the building of St. Peters satisfied the spirit of another age. Both of them, are built in an attempt to get into some sort of contact with the ultimate truths of the world and the purpose underlying things. The reasons for building St. Peters and the reason for building the pyramids, and the reason for building Laboratories are fundamentally non-logical but are

none the less extremely obvious and appealing to everyone who has an opportunity to understand what they are for, and see what they are doing. I believe that in a very real sense, the achievements of these great establishments are among the most important, the most intellectually exciting which our age has recorded.

May I say to the ladies, your husbands are very privileged men, to be able thus to disport themselves at the expense of the rest of the population. And that brings me to a point which I must speak about, because it is a matter which concerns me very much - the general problem of the mounting cost of science.

I was a student with Lord Rutherford in the Cavendish Laboratory in the early 1930's and I managed to find some record of the budget that that great man had at his disposal. He never spent more than £2,500 a year on his research and with this quite extraordinary sum not only did he discover the principles which underly nuclear power today, he discovered the principles which lead to the developments in high energy physics which you are going to discuss this week. He also maintained no fewer than eight Nobel Prize men on the staff and established a record which will never, never be rivalled much less broken for the number of Nobel Prize men who can be run per £1,000 per annum in any given Laboratory.

Nowadays we talk in terms of 300,000,000,000 volt accelerators and, what to me is more important, £300,000,000 budgets. The cost of science is in fact beginning to be extraordinarily and dramatically big. It is rising at a remarkably high rate. We have been trying to get some figures and, although they are not very reliable, they suggest that the total cost of science is rising at about 16% per annum in England and has done for the last 10 years. No country has ever succeeded in getting its gross national product to go up at this rate, 3 to 6% is more normal, and one can easily deduce that if this trend continues to say the year 2000, we shall be spending more on science than the total gross national product. Furthermore, any time now we shall be spending more than we can afford.

A great many things have been growing almost exponentially for a very long time, and they have done so independently and without mutual interference. The electrical engineering industry is a very good case in point. It has grown at a perfectly steady rate, doubling every eight or nine years, since about 1900, and if it goes on until about 1980 every employed worker in England will be an electrical engineer. You

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can deduce from the rate of growth of the chemical industry that every employed worker will, at the same time, be a chemist. You can deduce that he will probably be engaged in the retail trade, that he may well be engaged in providing personal services, and you can also certainly deduce that he will be permanently stuck in a traffic jam.

The extraordinary thing is that these trends and tendencies have been going on in some cases for a hundred or more years, and in such a way that the fact was not apparent until recently. The best example I can give is the growth of science itself. The number of scientific papers and the number of people engaged in writing them has doubled every ten or twelve years since the time of Sir Isaac Newton. For a very long time of course, there were very few scientists in the world and those who existed were thought by representatives of the great university which is not so far from here to be altogether mischievous and perhaps to be pitied rather than to be blamed. You will remember that for a long time this university was firmly persuaded that the only education that a gentleman could follow was a classical education. Dr. Gainsford who was Dean of Christ Church not so very long ago remarked that the advantage of a classical education is twofold - "Not only does it allow us to look with contempt upon those who have not shared its advantages but it fits us for places of emolument both in this world and in that which is to come". And Dr. Pusey who was I think at Balliol, referred with approval to what he described as the sacerdotal functions of a celibate professoriat. Oxford may have declined in one way in that it no longer requires its professoriat to be celibate but none the less it didn't believe until very recently that science was a particularly good thing. Nowadays Oxford has the largest school for chemists in England, one of the best schools of physics and a very good school of engineering. So times are changing.

This rate of change, has got to stop quite suddenly. If it continues for about another hundred years, not only will every man, woman and child in the world be a scientist but so will every dog, horse, cow and mule. The point I am trying to make is this - a large number of things, science in particular have all been growing exponentially and steadily for quite a long time. There are now more scientists than there are clergy in the Church of England and officers in the army put together; in other words they are numerically significant. Furthermore, the demands they are making on the public purse are getting to be quite alarming.

The problem which is confronting every country with a large scientific population is the same - how are we to control this immensely rapidly growing expenditure, how are we to control the number of scientists and how is the matter to be organised? It is a tremendously complex and difficult problem, and, although many people have studied it, no one has solved it. The problems that it poses are much worse than one might at first think. As long as science is growing steadily and exponentially it is possible to start things without any difficulty and allow the old ones to carry on much as before. But the time is going to come very soon when this process has to stop and then it will be possible to start new things only if you can save money by stopping old ones. Anyone who has tried to run a university, or anything else, knows how impossibly difficult it is to close things down. Since this will become, quite soon, a necessary condition for further growth, the whole nature of the process by which science is organised, governed and run is going to have to change dramatically in the course of the next ten years, and we must be thinking about it now. This is the point I wish to make and to leave with you. They are problems which governments will have to solve in every country whose science is developed.

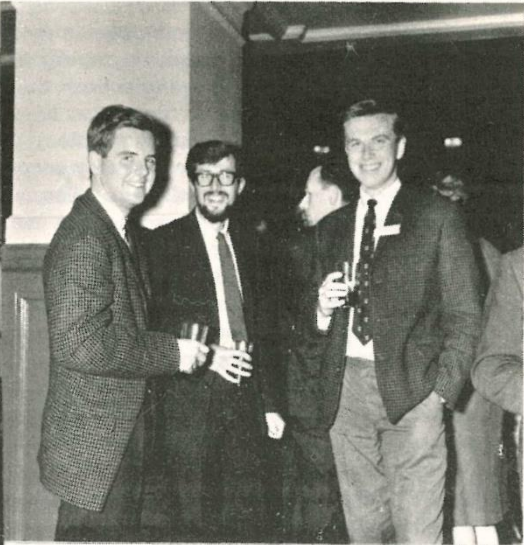
We have attempted to set up an organisation to study, the problems in England and we are finding it extremely difficult. It is hard to devise criteria to judge the relative merits of programmes and their relative claims on Government finance. We now have to face the fact that someone has to decide how much money to spend on leprosy and how much on high energy nuclear physics ... There is no calculus with which such calculations can be made; no method by which they can be compared on any basis of fact. We must try to devise some technique by which comparisons can be made, and resources allocated. It is an incredibly vexacious and complex problem. All I can say is that it has to be solved, because the funds we have at our disposal, are such that these choices have to be made. Our budget is limited and we are trying to decide how rapidly total expenditure can be allowed to mount and what is the effect of curtailing it.

The Treasury's view of anything, professionally, is "Whatever it is, you can't have it" and you start from there. When one is confronted with a requirement to justify expenditure on science, one can do it on two grounds, either that it is of enormous economic significance or alternatively that it is of immense intellectual interest - sometimes things happen to fall into both categories simultaneously. It is true to say that

things which are economically significant are important but it is impossible to tell in advance what is going to be economically significant. To the date of his death, Rutherford stoutly denied that any of the work that he did would be of any economic significance to anybody - in other words, he refused to believe in the possibility of nuclear power. When I talk to high energy physicists they are equally confident that nothing they do will ever be of the slightest economic significance. They may well be right but to decide, in advance, from any particular programme of work what is going to be economically significant is impossible.

On the other hand, we cannot in the future support everything merely because people cannot say whether it is going to be economically significant or not. All one can try to do, from the Government, is to steer things. You find if you come to look into it, that you can't make abrupt changes in peoples funds without making gross inefficiencies. An organisation once established cannot suddenly be stopped without immense waste both of men and very often of expensive apparatus. You find furthermore that you can't even make abrupt changes in the rate at which the budget is expected to change. The best you can do is to alter about the third or even the fourth order differential coefficient, and even that you can't do very abruptly. In other words the Government's powers to intervene are much less than one would like to think. Furthermore, programmes of work and fashions in science tend to be world wide and almost simultaneously obvious. This is very largely because of the opportunities for people to inter-change ideas at Conferences like this. But some of the fashions have been as inexplicable to me as the fashions for example of the Beatles. How the world climate of opinion suddenly approves of Beatles and why it suddenly approves simultaneously of certain types of high energy physics, these are mysteries that I cannot understand. All that I can say is that a Government which ignores them does so at its peril.

I have tried to give you the impression that the problem of maintaining and developing and encouraging the work such as you yourselves are engaged in, are vexacious are difficult and are exercising the best efforts of those people who are unfortunately saddled with the administrative responsibility for looking after them. I would like to conclude by saying that we realise just how fortunate we are to work with such marvellous apparatus and engage in some of the most exciting activities that this or any other generation has yet seen. I would like to wish your Conference well and all possible success.



About 550 scientists gathered in Oxford for the Conference on Elementary Particles. They came from over thirty countries, predominantly European since this was the third of a European series of Conferences, but including also America, Brazil, Canada, Egypt, India, Israel, Japan, Pakistan and Russia. With them came wives, children and friends who, to quote Professor Weisskopf, were "delicately called" associates. The whole gathering was in excess of seven hundred people.

Oxford looked splendid in mellow sunshine that, by an incredible stroke of luck or someone's prayers, lasted right through the week. This helped a lot towards the success of the Conference.

The Inaugural Session and a special session on the proposed European 300 GeV machine were held at the Oxford College of Technology, Headington. On Monday and Tuesday, three theatres (physiology, inorganic chemistry and the museum) in the Oxford University Science Area were in operation for parallel sessions. From Wednesday, plenary sessions, where leading figures from the world of elementary particle physics addressed the Conference, were held in the Oxford Playhouse.





A full programme of entertainment was arranged for the "associates" so that they would not feel too lost while their husbands wrestled with SU3. And for the Conference participants themselves as the photographs probably indicate, the philosophy that "all work and no play makes the Oxford a dull Conference" prevailed.

The photographs on these two pages were taken at a Civic Reception in the Oxford Town Hall on Tuesday night, 21st September. The Conference was welcomed to the City of Oxford by the Sheriff, Councillor Olive Gibbs, accompanied by her mother-in-law Mrs Rose Christian and her husband, Councillor Edmund Gibbs.



On the centre pages are photographs from the Old English Ox Roast held at the Shillingford Bridge Hotel on Thursday night, 23rd September. Mr. Alf Weller of Bayworth roasted the ox and the evening proved, for one reason or another (chiefly another) to be one that most people will remember for a long time.



The Conference

PK Kabir
RG Moorehouse

On Monday and Tuesday the Conference was divided into three parallel sets of sessions, held in the lecture theatres in the Science Area within easy walking distance of each other. For those with interests in more than one of the parallel sessions the fine weather made commuting pleasant.

Two of the sets of sessions consisted of a large number of short presentations of recent experimental work; the set of sessions on resonances (or unstable particles) gave a strong impression of the great and successful efforts at present being made in searching for these objects - a large number of nearly new resonances were reported, some in posse, some in esse.

The other experimental sessions were on high energy scattering and production processes and on weak interactions. Contrasting with the experimental sessions, invited longer papers predominated in the theoretical parallel sessions and accounts were given, among others, of the present state of axiomatic field theory and the foundations of S-matrix theory. Though the contact of these difficult theories with physics is, at present, small it should not be forgotten that some germinal scientific work has only borne its full fruit after decades.

Also in the theoretical parallel sessions Professor Cutkosky reviewed the connection of "bootstrap" theories (by which particles dynamically generate each other) to symmetries and put forward the point of view that symmetries may just be dynamical accidents and only exhibited in the ground and low-lying excited states of systems. A review talk by Dr. Prentki on CP-violation was devoted mainly to the possible consequences of the hypothesis that there may exist strangeness-conserving C-violating interactions of strength comparable to electromagnetic interactions. Experiments by the Columbia group have shown that charge asymmetries in pp-annihilation do not exceed one per cent, so interest is now mainly concentrated on the possibility that the electromagnetic interaction of hadrons may not be invariant under charge conjugation. The status of

this subject may be summarised in the statement that although effects which could have been large are in fact small, the theory is able to explain these away. There were some interesting theoretical contributed papers, including two from Italy on "quark" models of the elementary particles (in which the elementary particles are constructed out of quarks as if these latter were real particles - as of course they may be).

Plenary sessions, in which invited speakers reviewed the topics of the greatest current interest, occupied the last three days of the Conference. Professor Dalitz gave a complete review of the "quark model" theory, in which baryons and baryonic resonances are composed of 3 quarks, and mesons and mesonic resonances of 1 quark and 1 anti-quark. He classified all the existing resonances by this model in which, in the baryonic case for example, the SU3 octet and the SU3 decuplet of particles have orbital angular momentum added to the intrinsic spin of the quark state. There are some predictions of this theory, not made by the higher symmetry theories (as described in the talks of Gell-Mann and Salam) which at present agree with experiments. It is interesting that before any of the semi-stable elementary particles had been discovered (except for the neutron) Yukawa predicted the pion from the existence of nuclear forces and that the first of the unstable particles, the ρ -meson, was foreseen from nuclear form factors. If the intermediate boson (W), which is postulated from more general considerations, exists - and still more the quarks - then we might say that mid-twentieth century high energy physics is characterised by the materialization of thought: cogito ergo est.

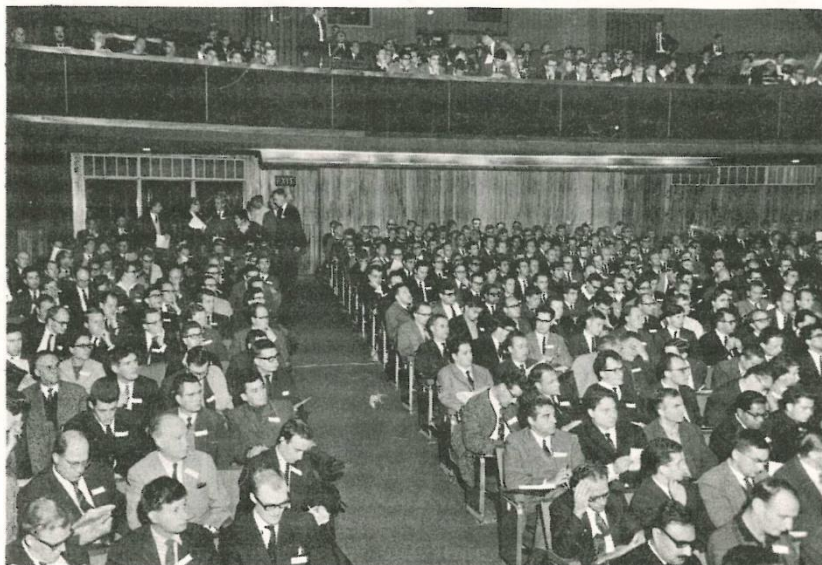
Professor Gell-Mann however, was quick to dematerialize the quarks. One of the non-compact group schemes he put forward as a likely candidate for the classification of the elementary particles greatly resembled the "quark model", but with the quarks invoked as classificatory mathematical entities rather than as objects subject to quasi-dynamical laws as in

Dalitz's talk. Gell-Mann also emphasised the great measure of agreement among theorists, and showed how the $U(12)$ symmetry of Salam and his co-workers, is, when broken by spurions, equivalent to the same hierarchy [hierarchy in the sense that there is most symmetry for stationary systems, less for systems moving in one dimension, still less for two dimensional motion and least (just SU_3 symmetry) for three-dimensionally moving systems], of symmetries developed by Gell-Mann and other workers. Professor Gell-Mann's discussion was largely based on the "algebra of current commutators" a concept which he developed in 1962, by which (in one of its aspects) the integrals of currents have certain simple commutation relations. One of the most striking developments of 1965 was a calculation of the ratio of coupling constants, g_A/g_V , in weak interactions using the Gell-Mann rules.

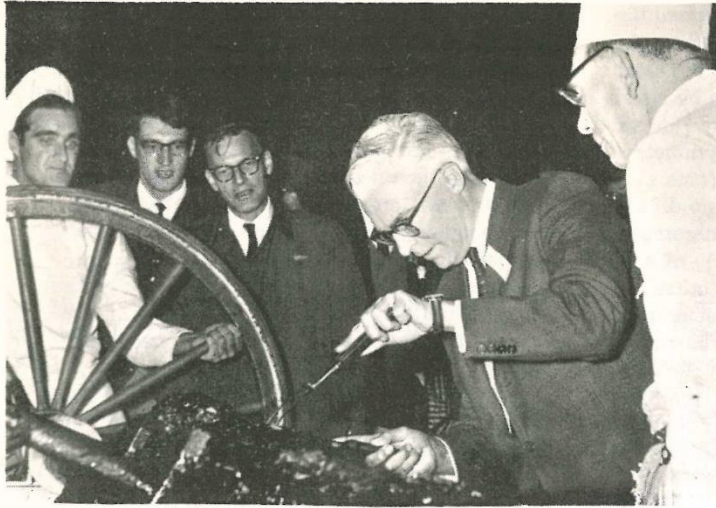
It is symptomatic of the dominance of "symmetry" ideas in the past year that Professor Salam was able to include in his summary talk to the Conference a further review of the theories. This formed a valuable complement to the talk of Professor Gell-Mann, since Salam discussed the symmetry theories from the point of view of the intensive work of the school of Trieste.

A thorough review of quantum electrodynamics was presented by Professor Pipkin who concluded by reminding us of his measurements on wide-angle pair production of electrons which are so far the only indication of a breakdown of the theory; it is interesting that the corresponding experiment with muons shows no anomaly.

Dr. Bell gave an elegant account of the phenomenological analysis of long-lived K^0_2 decays, and the experiments which must be performed to obtain a complete description of the process. The highlight of the Conference was a brilliant lecture by Professor T. D. Lee in which, after reviewing the present status of our understanding of weak interactions, he launched into a far-reaching series of speculations on possible symmetries of these interactions. Of these, the most spectacular were his remarks on the space-time symmetries which called into question our understanding of the very basis of physics, i.e. the meaning of measurement. He illustrated by some simple examples that some apparently evident statements, e.g. that parity is violated in β -decay, were based on convention only and that by suitable re-definition, one could say that parity is conserved in the weak interactions of pions but violated in their strong and electromagnetic reactions. He went on to suggest that perhaps the definition of the space time transformation, P, C, T could be different for the different types of interactions although the combination PCT should probably be common to all, because of the more general geometrical interpretation of the latter. Then the various non-invariances which have been found in recent years could be ascribed entirely to our use of an inappropriate description of the corresponding phenomena. He put forward as an example of such an idea the notion of a charged hadron which would nevertheless be self-conjugate with respect to charge conjugation of the strong interactions (perhaps, hadron conjugation?). These challenging notions are obviously quite new; undoubtedly we shall hear more in the future.



The Conference in Session at the Oxford Playhouse.



Dr. Pickavance, Director of the Rutherford Laboratory cuts the first slice from the ox.



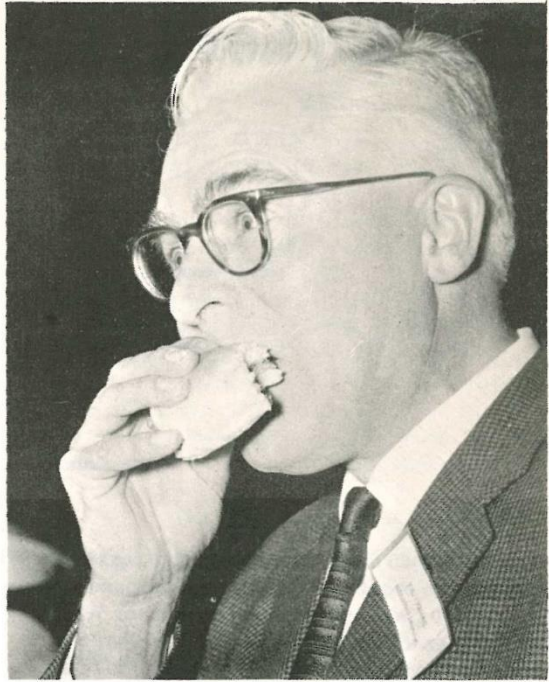
'I found out that the urge for food is greater than the urge for knowledge' Professor Weisskopf about the Ox Roast.

The Old English



The Headington Morris Men and two of their audience.





sh Ox Roast



THE 300 GeV SESSION

On Monday 20 September, a special session was held in the evening to discuss the proposed European 300 GeV accelerator. Professor Weiskopf opened the discussion and said that the Amaldi report on the future European high energy physics programme had had a "sympathetic echo among the governments of Europe". Its recommendations for improvements at CERN have been supported - principally with the approval of the storage ring project. Sixteen sites have been put forward by member states for feasibility studies for the 300 GeV machine site.

However, no government has so far committed itself to the large accelerator project and Professor Weiskopf called on the audience . . . "We need you, and everyone of you, to convince the public, essentially, that this is a necessary step to take".

The situation in America is "relatively favourable" and it seems certain that construction of the proposed 200 GeV machine there will begin soon. If then the 300 GeV step is not taken here European high energy physics, which is now at a level in quality and quantity to compare with anywhere in the world, is doomed. We have an "obligation to the future" to ensure this machine is built.

Dr. Johnsen, who led the design study on the 300 GeV machine at CERN, spoke on the accelerator itself. The design study considered an alternating gradient machine with an intensity of 10^{13} protons per second (3×10^{13} protons per pulse). Injection would be via a 200 MeV linac and an 8 GeV booster synchrotron into the main magnet ring $1\frac{1}{2}$ miles in diameter. The detailed parameters are given in CERN Report AR/Int SG/64-15.

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The construction period is estimated as 9 years and the cost is about £130 million. An area of about $7\frac{1}{2}$ square miles is desirable for the site, most of it reasonably flat with stable ground, free from seismic disturbances and swelling due to water. Site access, and power and water supplies must also be good. The map shows the location of the sites, marked with a star, put forward by CERN Member states.

Professor Puppi discussed the high energy physics justification of the 300 GeV machine and covered the significance of investigation at higher energies and intensities in the light of present problems in strong electromagnetic and weak interactions - leaving aside the new phenomena which will probably appear but which cannot be predicted. Even though some useful information could come from cosmic ray studies, a few pulses from an accelerator are equivalent to a year of cosmic rays and for systematic investigation a machine is necessary.

High momentum beams, increased yields of antinucleons, beams of hyperons and neutrino beams (a factor of a hundred up on present intensities) would be available. With these facilities the ambition of all fundamental physicists to understand why so many different particles and forces appear in Nature would undoubtedly be carried much further. Professor Puppi finished with a quotation from Hamlet. "There are more things in heaven and earth than are dreamt of in your philosophy".

Professor Gregory considered the national and international aspects of the European programme.



To enable international projects to be usefully exploited, strong national support is needed. At present for example, three quarters of the work involved in the bubble chamber and emulsion experiments actually performed at CERN, is distributed among national centres. A similar tendency is developing in spark chamber and counter work.

The reasons for national machines are - to supplement the international programme (the Amaldi report made no provision for a large electron machine, pion or kaon factories in

Europe); to provide sufficient facilities to cater for the number of scientists expected to be interested; to avoid over centralisation with research too heavily influenced by too few people.

The detailed considerations of the proposed programme for the next ten years, suggest that budgets would expand by a factor of 3 and manpower by 2 to 2.5. This is not considered out of balance with other national and international expenditure. National governments are now being asked to sanction a start on the 300 GeV machine which would be the key element of the European high energy physics programme for the next few decades.

u t s i d e
O H o u r s



In Council Suzette Harold



You might become a local councillor if you felt strongly about drains or the better provision of putting greens, or because you felt your authority should be supporting Hughie Green instead of symphony orchestras. You might become one because you had a suspicion that your present council consisted entirely of nitwits. . . . One of my main reasons was that I felt people in Oxford were paying more rates than many of them could afford.

Each year, we elect two councillors for a ward, whose term of office is three years. In March, my fellow Conservative candidate and I started to visit electors and their families in our ward, to acquaint ourselves more nearly with their views, and to make ourselves known to them. We have over 8,000 electors and, by May, I think we had met the majority - or at least called on them, for you would be surprised how many people are out in the evenings (especially those who live in flats). I liked meeting all these new acquaintances very much, for everyone was kind, even if they did not all agree with my politics. I was also becoming more disturbed at the excessive demands both rates and taxes were making, particularly on retired people. Under our Socialist controlled council, rates had risen 1s. 2d. in the pound in the last year. National taxes had severely risen in November 1964 and 1965. We had the biggest increase in public spending for the smallest increase in social services.

Local government already absorbs one tenth of our national income and even small increases can accelerate a dangerous trend. In Oxford we cannot afford, any more than other local authorities, to reorganise our excellent secondary schools; particularly on a comprehensive system which has some advantages but is so far unproven educationally. On the other hand, we have to spend money on aid for the elderly, as we have an aging population and a shortage of domestic help. A retiring councillor felt the time was unsuitable for spending more on Old Peoples Homes, but we thought that this was one thing that must go ahead, and was far more necessary than a wholesale reorganisation of secondary education. We also objected to thousands of pounds being spent on ornamental gardens at this juncture.

We were elected to the Council in May, and were highly delighted to find we had an overall majority over the retiring Liberals and the Socialists. The next, and very important, happening was the allocation of Committees. Luckily, vacancies occurred on two standing committees and a special committee, which were among my first choices. I could have been asked to serve on committees in which I was far less interested, or which met at difficult times. I was only sad that one must serve some years on the Council before being considered for the Finance Committee, though I am sure that this is quite right and proper. Our City Finances have been taking a beating this year - though perhaps they are not yet quite so bad as in the 18th century. The circumstances then were even worse than usual and varying sums were exacted from members on their resignation from the Council. A Mr. George Smith, on wishing to retire in 1718, paid a fine of thirty guineas and was compelled to donate the small extra of 40 bottles of wine to the Corporation. Luckily, this no longer seems to be the custom. . . .

The Committee and Council work takes a good deal of learning, but becomes extremely interesting. My party, The Conservative and Unionist, never demand that I vote on a party line, or tell me what to say, though my more senior Councillors are always helpful when I need to know more about a question. Dealing with personal problems can be both absorbing and, at times, sobering. The Town Hall staff are always as good as they can be, but sometimes there is nothing to be done for someone. One only hopes that this turns out to be the rarity.

All in all, if you enjoy meeting people and talking about local issues, I think you'd like being concerned in local government. For a woman in Oxford, I can, moreover, recommend the long blue robes trimmed with velvet and the tudor caps which we wear formally. And good luck to you if you stand for election, because in all its spheres, local government needs many more candidates for the councils.

Outside
Hour



In Council Alec Spurway-->



The ratepayer's view of local government has an elemental simplicity. Councillors are large, solid men wearing waistcoats adorned with several gold watch chains. They speak slowly in comic north country accents, and are an amalgam of stupidity, small-mindedness, petty graft, pomposity and vanity. They reach a peak of apoplectic debate when discussing drains, teenage sex and whose turn is it to be Mayor.

An exaggeration? Of course, but the most frequent remarks one hears at election time must be "They're all the same" or "They're only out for what they can get out of it". (The most frequent reply from women who are asked how they intend to vote is, "I'll get my husband"). Thus insulated from reality the voter is free to take the minimum interest in Council affairs and leave us to get on with local democracy undisturbed by the vulgar clamour of the electorate. This situation is not displeasing to some councillors.

How true is the Mr. Swizzlewick image of local government? It would be idle to pretend that there isn't some basis for it, especially in the smaller backwoods councils, but in general the reality is far from this image. The sheer size and scope of local government is such that it attracts some people of real calibre. Local government expenditure is now about £3,000 million (11.6% of the G.N.P.) Extrapolation of current trends leads to an expenditure of £5,000 million (13.6% of the G.N.P.) by 1972. Not only a large slice of the cake but one which is growing at a faster rate than the cake itself.

This sort of expenditure inevitably means that local government extends to every aspect of modern life. My most recent monthly council library list includes titles of articles on cancer, car parking, child welfare, coloured people, comprehensive schools, desalination, housing, medicine.... Here is the very stuff of government, so much so that a good case can be made for the view that the decisions of the local councils are in many ways more important to the average citizen than those of Westminster. One can see that being a councillor can easily become a full time job (which I do not advocate) and that the present part-time arrangements would be impossible unless the majority of councillors have a very real sense of service to the community.

And the realisation of this sense of service is my strongest impression since being on a council. My other strong impression is of the fairness of the councils on which I serve. In both, I belong to the minority political party, but at no time has there been any discourtesy to me, or any refusal to hear my, no doubt to the other side, somewhat brash and intemperate views. Particularly in committee, anyone who has done his homework and is trying to make a contribution, as opposed to making a debating point, is usually listened to with tolerance and respect. I must say, incidentally, that county council committees make RHEL committees look the utter shambles they are.

Against this picture of tough, determined and public spirited women and men it must be admitted that there is a good deal of friction about. Public apathy, the time consuming nature of the work, and the very restricted nature of some of the powers of local governments, make this inevitable. Parliament has quite clearly been extremely mistrustful of giving any powers to local government. Not only do we, unlike M.P.'s, have to publically declare any financial interest we have in any matter before us, but all Council borrowing has to be sanctioned by Whitehall. Our actions are liable to inspection by the District Auditor, who can also surcharge the councillors individually for any expenditure he considers unreasonable. There is a famous House of Lords decision which resulted in the Poplar council being surcharged for paying too high wages to their dustmen. (I believe the ratepayers paid the legal fees involved). Since this means that in many fields the Councillor's job is an almost perfect definition of responsibility without power, the frustration must lead to a considerable loss of good people from councils.

These then are a few impression of eighteen months in local government. It is common ground that the whole system is in need of radical reform, if only to prevent the rate system collapsing under the load placed upon it. It would be easy to say, 'You get the local government you deserve,' but it would not be true. It is much better than that.

There are, alas, no pork barrels.

Orbiting Around

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

An Associate's View

Professor Weisskopf in his concluding remarks as chairman of the final session on Friday afternoon, referred to "the wives, or as they are here called so delicately, Associates". The Conference itself has been covered in the front half of ORBIT and Orbiting Around with its particular interest in people, set out to discover if another side of the Conference (the programme arranged for the associates) was as successful. It was, in the view of Madame Maeder, wife of Professor Maeder who is Swiss and lives in Geneva.

A visit to England, was viewed with a certain amount of apprehension. With many long hours to fill by oneself, conferences can drag on. But a week in Oxford was after all something to look forward to, and of course there was always the English breakfast. But after arriving late in the evening and staying near London Airport for the night - the English breakfast, proved to be only rolls and butter. This, however, was only a temporary setback, for in Oxford all was well. Then, for some reason not yet explained by the organisers, the sun appeared, and stayed. One hears so much about English food and English hotels that it was pleasant to hear both praised. Fresh vegetables were especially appreciated, although a little difficulty was experienced over the Large English peas. Eating peas with a fork in the reverse position is easy when dealing with the very small peas usually served on the continent but those English peas. Brown sugar served with coffee was a surprise - normally in Geneva it is obtainable only in Health Shops.

But what happened to those long hours waiting for the daily sessions to end. The programme in fact was so full with trips to Coventry, Stratford, Hidcote Manor, Blenheim Palace, etc., that Oxford itself had to be explored in spare moments with only Friday left to really stroll down back lanes, admire lawns and look into all those odd corners. And that was not long enough. Oxford in the warm Autumn sunshine was looking at its best and the wish for an extended stay for two or three weeks, was perhaps better not fulfilled, since the rains began again on the Saturday. Returning to food, special mention must be made of the Ox Roast

which was enjoyed immensely as were the other receptions. Obtaining a slice of ox was, shall we say, difficult. Success was achieved by Professor Maeder after a scrum lasting 1½ hours but well worth the effort. But the man with the carving knife was a little frightening.

In between excursions, shopping was interesting, especially for woollen goods which were excellent and much cheaper than in Geneva.

Thank you Madame Maeder for your view of the Oxford Conference week, Orbiting Around has very much appreciated them and hopes that your acquaintance with Oxford will be renewed again sometime in the not too distant future.



Our Favourite Associate - Michie, the three year old daughter of Dr. M. Konuma and his wife Masae.

Successful First Year



At the A.E.E. Winfrith Apprentices prize giving ceremony on Friday 8 October, The Senior Management Cup (for outstanding achievement during the first year of apprenticeship) was awarded to Gavin Shand, an electrical apprentice at the Rutherford Laboratory. Gavin, who is now in his second year, is spending the next few months in the Electrical Services Section, R18.

He is fond of playing football, but finds little time for such activities due to study, although he did get a few games for the hostel team whilst at Winfrith. The first year he found to be very interesting and enjoyable, thanks to the good atmosphere at the apprentices' school, the excellent instruction and the variety of jobs to do. The school now takes about 40 apprentices, fairly evenly divided between the electrical and mechanical sides. Gavin who lives on a farm at Uffington will be 18 at the end of the year.

With still four years in front of him before he completes his apprenticeship he is naturally uncertain which branch of electrical work he will follow, but it seems certain that if he maintains the standard he set in his first year his future should be assured. Orbiting Around will be watching the annual prize giving list with interest.

A New Venture

In co-operation with our French colleagues from Saclay, General Administration Group have extended their activities to the field of primary school management.

On Monday 11 October, a class for the children of the Saclay visitors was started at the Cosener's House, Abingdon under the supervision and instruction of Mademoiselle Françoise Galy. The accommodation and furniture have been provided by the Laboratory and the parents have arranged for Mademoiselle Galy's services as teacher.

Since their arrival a year or so ago, the children have been attending primary schools in the area but now their parents are becoming concerned least, as they become more accustomed to being taught in English and to an English curriculum, the children may not easily be able to revert to a normal French education when they return to France in about a year's time. Arrangements have been made for the children to continue at their local primary schools in the mornings and to have their own course conducted in French in the afternoons. The Director of Education has given his provisional approval to the arrangement and will inspect the course when it has been in being for a few weeks.

The curriculum is determined by the Ministry of Education in Paris who send weekly instructions on the work to be undertaken. The children's work is then sent back to Paris for marking and comment.

We are very pleased that we were able to help our visitors in this venture and we wish the course every success. W.W. Woodall.

Dancing Time

The Rutherford and Atlas Laboratory Recreational Society announce their first dance, to be held in the Restaurant on Friday 19 November from 8 p.m. to 2 a.m.

Sid Wagstaff and his Music, by popular request, will be 'in attendance'. Tickets 7/6d (licensed bar and buffet) are available from committee members.

Back From Berkeley

A two year stay in California must be the dream of a lot of people. Ralph Thomas has recently returned from Berkeley where he spent the last two years as a member of the Accelerator Design Study Group, working on radiation problems, shielding etc. for the proposed 200 GeV Proton Synchrotron.

Living for the greater part of the time in the Berkeley Hills with a wonderful view of San Francisco and the Golden Gate, it is not surprising that his wife, who at first didn't want to go to America, was very sorry to come back. Add to the view, a climate where the average winter temperature is 55° rising to 65° in summer, a house with spacious rooms, central heating etc., and very helpful and friendly people, this reluctance to return is not really surprising. Ralph, his wife and two children (not quite correct - they went with two children and came back with three) certainly found the famed American hospitality to be very true - at least in California. What of the children and schooling - here again they found that schools, especially for young children, are very good with a prevailing philosophy that "School is fun".



Mention was made of the friendliness of the people, this is certainly partly due to almost everyone being 'strangers'. The average Californian moves once every five years and most of them are immigrants from other parts of the country or of the world. This helps to make people friendly and helpful but results in a tendency not to develop very deep friendships. Living costs are roughly the same as in this country, but luxury goods are much cheaper, which enables most people to enjoy a higher standard of living. The country and coast is very beautiful and although San Francisco offers quite a lot in the entertainment field, the main attraction is to get away into the hills, the parks or on to the beach. Ralph found the atmosphere at Berkeley very stimulating. He feels that the success of Berkeley is due to the terrific enthusiasm and the ability of people there to work together. And, as a final quote, "at Berkeley, the dog wags the tail".

The Winning Way

George Didcock continued his run of success in three more shows and added 4 more cups, a blue riband and 25 first prizes to his collection. At the Thame Show which is the largest one day show in the country, George collected the Blue Riband for the best exhibit in the show, one cup and four first prizes.

His grand total of first prizes for the season is over the 100 mark and he was not beaten once for his display of onions.

Exchange Visit

Ken Batchelor left on Friday, 15 October, for a 13 months exchange attachment at the Brookhaven National Laboratory. Ken has been to Brookhaven before, but this time he is taking his wife and three daughters along as well. One gathers that the excitement is intense. Jack Bittner from the Accelerator Group at Brookhaven is now at the Rutherford Laboratory. Ken and Jack are doing more than exchange posts for the next year, they have also exchanged houses and cars. As mentioned before, Ken however, is taking his wife and family with him.

Retirement

Bert Bevan, patrolman at the Rutherford Laboratory for the past four years retired at the end of October. He was previously with the Atomic Energy Research Establishment for 6 years. Bert who was 70 last February, is away from work at the time of writing, but he has in fact only needed 4 weeks sick leave since joining AERE in 1955. Extremely well liked by his colleagues, Bert has proved a good workman. He likes a game of darts, and a drink, but above all horses. His colleagues and friends will know very well that the horses also have jockeys. Bert loves spotting the winners - well, some of the time - and every year had a day or two at Ascot with a party of friends. Orbiting Around offers him best wishes for a speedy recovery and hopes he will find a lot more enjoyment on his small holding south of Newbury and in picking some more of those elusive winners.

Record Programmes

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

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| 2 November | Liszt "Les Preludes"
Sibelius Symphony No 7. |
| 9 November | Billie Holiday Concert. |
| 16 November | Mozart Overture "Marriage of Figaro"
Mozart Sinfonia Concertante for Violin, Viola and Orchestra. |
| 23 November | Selection "White Horse Inn" R. Stolz. |
| 30 November | Kathleen Ferrier Recital
Schubert and Schumann. |

Suggestion Awards

At the thirtieth meeting of the Suggestion Awards Committee on Wednesday 22 September, the following awards were made:

£3 to W G Black whose suggestion to use a Mandril for fitting pumps to the octant ram mechanism has been adopted.

£2.10s. 0d. to B J Furse whose suggestion to utilise a roller stand when using the R9 bandsaw will be adopted in principal.

£2.0.0d. to A V Wells whose suggestion has drawn attention to a safety hazard in the R20 Extension access tunnel.

£2.0.0d. to R W Wheatley whose proposed modifications to the R2 acid bath will be adopted in the future.

£1.10s. 0d. to A Richards whose proposed modification to the R2 bandsaw will be adopted.

Encouragement Awards of £1 were made to D A Morris, J Purling, L West and C D Moreton.

B Briscoe, Secretary.

Comings and Goings

Prof. N Horwitz, Prof. J B Warren, J W Hiddleston and R J Gray join HEP Counter Group (Visiting Teams).

Mrs R E Brody and R P Williams join Theoretical Studies Group ; Dr. D W Devins joins the PLA Nuclear Physics Group.

F J Williams, D Gadd, B J Wheeler, R Page and Mrs M E Hackett join General Administration; R Lascelles and P F Sadler join Nimrod Machine Engineering Group; S Jaroslowski, G R Thomas and I Cook join Central Engineering Group.

H J Wintle joins Nimrod HEPE Group; M W Butler and Mrs J S Nicoll join HEP Bubble Chamber Research Group.

Miss L J Green and Miss A J Stirling join Atlas Operations Group.

A Gilby and P H Perring join as Student Apprentices; T N Channon, M B Davis, S Hancock, D Morrow and D Oats join as Craft Apprentices.

Dr. A C Hearn, Dr. P C Rowe, Dr. J M Scarr, J R Clarke, E C Jennings, D A Wheeler, Mrs P Bridgeman, A J Hunt, D Whiteside, Mrs E Forde, C A Whitlock, K J Gregory, A Reynolds, R Rose, L Meers, R M Grice, R O Legge and R M Rafiq have left us.

Congratulations to:

Gilbert Payne, Central Engineering Group, and his wife Lorna, on the birth of a son, Mark Geoffrey on 7 August.

Mike Somerville, Central Engineering Group, and his wife Vivienne, on the birth of a son, Richard Charles, on 9 September.

Roy Tolcher, Central Engineering Group, and his wife Dorothy on the birth of a son, Philip James, on 21 September.

Alan Middleton, Central Engineering Group, and his wife Janet, on the birth of a son, Andrew, on 28 September.

Ralph Downton, H.E.P. Counters Group, and his wife Muriel, on the birth of a daughter, Bridget Louise, on 30 September.

John Ellis, Nimrod General Physics, on his marriage to Marion Faith Bore of Applied Physics Division, A E R E , on 2 October.

Clive Thomas, Nimrod General Physics, and his wife Kate, on the birth of a son, Allan, on 5 October.



Editor, Brian Southworth with the copy for the 40th Edition of Orbit, his last before departing for CERN. More about this move next month.