

Reflexions on the 300 GeV Accelerator

A record of a remarkable discussion about the future of the 300 GeV CERN accelerator has now been made available to *Nature*. The discussion took place in Vienna on September 13, during the high-energy physics conference, and consisted of the replies of a number of interested parties to a series of prepared questions. The October council meeting referred to by Professor Gregory is that due to take place in Geneva next Thursday.

What will be the role of these national accelerators when a new international laboratory comes into being?

Professor B. Gregory (Director-General of CERN).

One fundamental point in our field is that at a given point in time we should have the most modern equipment possible. If at the same time there is a set of less modern machines as a complement to the big machine, we are then in a very healthy situation. If, however, we do not have in Europe one of the best machines in the world, then I believe that activity in this field will slowly decay. I believe that some people will be invited to work on the US machine and will indeed participate in the work there, but in terms of the overall status of physics research in Europe, essentially this field will decay. Certainly for some time people will continue to work on the old accelerators, but . . . we should be in a position of having second rate equipment producing second rate results. Moreover, we should lose our best people to other fields and to other countries and there will be little opportunity in the future of regaining the situation. The 300 GeV machine is a piece of equipment that will be modern for a very long time and will preserve our potentiality in Europe with respect to the United States.

If the worst came to the worst, could the American project accommodate a significant overseas participation?

Professor R. R. Wilson (director of the 200 GeV project in Illinois).

The answer is with money "yes", without money "no". Without money we cannot even accommodate our own regional interest. But we could expand the intensity of the machine, I suppose. However, there is always the problem of so many hours, so many square feet, and you just cannot do everything. We should, of course, try and accommodate people from Europe if the worst came to the worst, but I think we should regard this as a pretty desperate circumstance.

If these are the principal arguments for the project, which then have the British Government disbelieved?

Professor E. Amaldi

I am sure that if we go on with the project, Britain will come in. I have absolutely no doubt in my own mind about this. There is even historical proof of it. If we go on and we do well, as we shall do, then they will join and they will become one of the top members of the new laboratory. I am quite sure that the important thing is to keep the other countries going and Britain will be with us later.

What interpretation should be placed on the statement of Mrs Shirley Williams in effect encouraging other European countries to go on with the project?

Professor B. Gregory

This statement seems to me a very important complement to the negative statement made in June. I don't think it can be overstressed that Britain remains a member of the organization at CERN. The new convention will provide for two laboratories and the countries who are members of the organization can elect to join one or both of the laboratories. The British statement in no way indicated that they wish to withdraw from the organization.

What is the intention regarding the scale of the project now in view of the British withdrawal?

Professor B. Gregory

Without British participation, we are not going to start the full project as it had been presented. It would be phased so that the contributions of those countries who do wish to join will not be greater than had been originally calculated. The project although scaled down will preserve the essential features of the original in such a way that the items cut out can be put back at a later stage with only a small penalty. The study is not yet complete, but one considers a reduced operation of the accelerator over the first two years, running at say 200 GeV instead of 300 GeV and the intensity reduced by a factor of 4. Then again the original project provided for two experimental areas with two extracted beams and this can be reduced to one. A major item also in the cost of the project was a large bubble chamber and we are considering postponing that project and seeing how we could re-adapt existing chambers or alternatively modify our experiments to make use of streamer chambers and other techniques. This will lead to a reduction equivalent to a little more than the contribution of Great Britain.

How can the project proceed now then?

The October council will be an extremely important meeting in establishing the time-scale of the decisions that now have to be taken. I think that we might assume that a certain number of other countries will give a positive answer between October and December and we should work on this basis. This would then provide the necessary number of participants for a major decision to be taken in December, but three months is a very short time and we have to revise the description of what countries are committing themselves to. We have to prepare for the selection of the site and a new director-general, and I think it would be the material aspects now of the decision rather than letters of intent which will determine the time-scale.

So there is a real possibility that the project can move forward as of March next year?

Professor E. Amaldi

I would say definitely "yes". If we can get the decision at the December meeting with the number of sites reduced to four, then maybe we could have a special meeting of the council in January, nominate a director and sign the description of what the countries engage themselves to. We have then four to five months to do this and it is during these four to five months that we shall hope to have the answers from a maximum number of countries.