

EYES ON SCIENCE

5 February, a great day for European science, opened with a throng of journalists assembled in the main auditorium of the European Organization for Nuclear Research.

A hundred and ten press correspondents were seated in the auditorium opposite eight distinguished scientists lined up on the platform beside Mr. François de Rose, President of the Council. A steady fire of flashes and questions was met with calm and objective replies. The correspondents of the biggest news agencies and papers and the most outstanding members of the cinema and television newsreel world, were face to face at CERN with a group of distinguished scientists such as can rarely have been assembled for the benefit of the press.

Facing the newsmen, apart from Mr. de Rose, were the following :

Professor Niels Bohr, Director of the "Universitets Institut for Teoretisk Fysik" at Copenhagen ; Nobel Prizewinner for Physics in 1922 for his studies on the structure of atoms and the radiation emanating from them ; member of the Danish delegation to the CERN Council.

Professor Francis Perrin, French High Commissioner for Atomic Energy ; member of the French delegation to the CERN Council.

Professor Edoardo Amaldi, Professor of Physics and Head of the Physics Department of the University of Rome ; President of the CERN Scientific Policy Committee and member of the Italian delegation to the CERN Council ; Vice-President of the "Comitato Nazionale per le Ricerche Nucleari".

Sir John Cockcroft, member of the United Kingdom Atomic Energy Authority ; Nobel Prizewinner for Physics in 1951 for "the transmutation of atomic nuclei by artificially accelerated atomic particles" ; member of the United Kingdom delegation to the CERN Council.

Professor E. M. McMillan, Nobel Prizewinner for Chemistry in 1951, Director,

Lawrence Radiation Laboratory, University of Berkeley, California ;

Professor J. Robert Oppenheimer, physicist and theoretician, Director, Institute for Advanced Study, Princeton, USA.

Professor Cornelis J. Bakker, Director-General of CERN, previously Director of the Zeeman Laboratory of Amsterdam University and of the Nuclear Research Institute of the same town.

Mr. John B. Adams, Director of the CERN Proton Synchrotron Division, previously at Harwell.

After the photographers had laid siege to the platform, Mr. de Rose said how pleased he was to see that so many journalists were interested in the scientific event being celebrated that day.

"There is no need for me to introduce the scientists gathered here to-day", he said, referring to the European scientists seated beside him. "However, I would like to say, how delighted we are to welcome Prof. McMillan and Prof. Oppenheimer, who have come to show the interest taken by the United States in our success."

After having outlined the day's programme, Mr. de Rose briefly recalled the reason for CERN's existence. "After the war", he said, "it seemed that the European countries, which until then had played a leading part in scientific research, and especially in fundamental physics, would no longer be able to construct the necessary equipment, on account of its complexity and high cost. From a scientific point of view it was a catastrophe. From a political point of view, it meant that just when science was playing an increasing part in bringing renown to individual countries, in the evolution of civilization and in the influence exerted by nations on civilization, the European countries were in danger of losing their weight and their influence. This was contrary to the wishes of the countries that were to form CERN. They have given European research scientists instruments comparable

to those which other more powerful nations were able to construct unaided.

Mr. J. B. Adams then gave an idea of the significance of the machine. "For a time it will be the biggest accelerator in the world", he said. "But what really matters is the fact that it accelerates protons to almost three times the energy of its predecessor, the 10 GeV synchrophasotron at Dubna in Russia."

Mr. Adams then mentioned the other accelerators under construction and finally stressed the ability of the team of designers recruited from all over Europe to design and build the accelerator.

It was then the turn of the audience. Questions and answers got under way, the answers being provided by the person with the most experience in the field.

Question : What research programme has been planned by CERN ?

Prof. Bakker : We are entering a new field in which we hope to find some unknowns. You can imagine how difficult it is to design a programme to find unknowns. In any event, the first thing to do is to see what happens when 28 GeV particles strike a target. About 30 elementary particles are known in physics. All these, including those with a very short lifetime, will be produced in greater numbers by the proton synchrotron than by existing accelerators. In particular it will produce all the anti-particles, anti-protons for instance, and will make the study of anti-matter possible. An attempt will also be made to discover how far Maxwell's laws of electro-magnetics remain valid in the immediate vicinity of the elementary particles. Generally speaking, as Professor Joliot-Curie pointed out, "experiments should be prepared so as to be sure of obtaining certain data from nature, while leaving the way open for the discovery of new facts".

Question : Will the machine be available to anyone wishing to use it for experiments, or only for the CERN staff ?

Prof. Amaldi : It is provided that between 40 and 50 % of the experiments can be carried out by teams of scientists from institutions in the Member States bringing their own ancillary equipment to CERN. However, because of the high energies of the accelerated particles, this apparatus is nearly as complicated as the accelerator itself. This calls for arrangements to be made in advance. Experiments will probably be carried out by groups consisting of both CERN staff conversant with the machine and scientists belonging to national teams. Such co-operation is of the highest importance.

Another aspect of co-operation between national teams and CERN teams must be mentioned : that relating to the bubble chambers which reveal the particle trajectories. These costly and complicated devices provide a very great number of photographs of nuclear events. However, they pose another problem : that of finding the way to analyze these numerous documents, to tell whether they have recorded a given phenomenon and, if so, to take measurements and interpret them. Because such a mass of photographs will be produced by the CERN and national bubble chambers, a certain proportion



In the morning of February 5, a press conference held in the CERN auditorium, confronted a hundred newsmen with nine of the leading authorities on fundamental nuclear research. From left to right on the picture on top of page 5 : Prof. Perrin and Amaldi, Sir John Cockcroft, Prof. Bakker, Messrs. F. de Rose and Adams, Prof. Bohr, McMillan and Oppenheimer. (Bertin photo)



of them will be entrusted to university laboratories for analysis. Thus, in a few months time a great many people all over Europe will be working on the bubble chamber photographs produced at CERN. This will constitute an additional link, an aspect of European co-operation which will extend far beyond the limits of CERN itself.

Question: Can you quote a specific example to show that international co-operation makes it possible to solve scientific and technical problems which could not be tackled by any national team alone, and can reference be made to one of CERN's earlier achievements?

Prof. Oppenheimer: A year and a half ago observations made in the United States on one of the elementary particles, the pi-meson, indicated that it never produced electrons in its radioactive decay. However, the theoretical work which had been done until then cast strong doubts on these observations. In the autumn of 1958, an international group under the direction of Professor Bernardini repeated the observations using the small CERN accelerator, proved that previous results were inaccurate and showed that harmony also prevails in this field of physics. This first major result obtained at CERN was acclaimed all over the world.

Question: Will the new machine make it possible to discover a formula unifying all the laws of nature?

Prof. Bohr: This question refers to the great expectations we have from this new field on the border of our knowledge, where we might discover a universal law applicable to all known particles. Their number appears very great to the scientists, who will certainly endeavour to find out whether we are on the right path.

Question: What other accelerators could be an improvement on this one?

Mr. J. B. Adams: We are studying new ways of accelerating various particles. Thus, we are interested in machines in which the targets could move in the opposite direction to that of the accelerated particles. The PS has fixed targets; it is obvious that if the target moved in the opposite direction to the protons, the effective energy would be higher. This could be achieved by using as a target another particle beam moving in the opposite direction. We are designing an intersecting beam machine along these lines.

Question: Are countries which are not members of CERN allowed to co-operate?

Prof. Amaldi: Yes. Other scientists besides those from the Member States have access to CERN, where anyone is free to come and talk with European scientists.

Mr. de Rose: In this connection, I should like to mention the Ford Foun-

dation which puts considerable sums at CERN's disposal to enable scientists from non-member countries to come and work here without involving the Member States into any additional expenditures.

Prof. Bakker: We have thus welcomed scientists from all over the world: from Japan, Australia, India, South Africa, Israel, etc. On several occasions, Russian scientists have come to CERN to attend our conferences and some of them have stayed on to follow our work. CERN is open to everyone and we are extremely glad to welcome any scientist who comes to work among us.

Question: Is there any automatic equipment to analyze the large number of photographs taken on the bubble chambers?

Prof. Amaldi: Yes. Various machines have been constructed for this purpose. "Frankenstein" in Prof. McMillan's laboratory is the most highly developed of all. There is a Division at CERN which has developed similar instruments, the IEP. This Division has maintained close contact with the universities interested in this technique and it also possesses several instruments of this kind.

Question: Will theoretical predictions be verified by the PS?

Sir John Cockcroft: Experience shows that it is difficult to foresee what may happen when a new machine of this kind goes into operation.

Prof. Oppenheimer: At present our knowledge is not sufficient to show us what to seek and what to find. It has been rather a matter of finding questions to ask the machine; such questions concerning the structure of elementary particles have recently been proposed; this machine could help us to find the answers, especially through the neutrinos which it will produce.

At present, we have good reason to think that we shall soon be able to "put our house in order". Not that we have been stupid until now, we hope, but because we lacked certain clues; this is one reason for today's excitement.

Many pointers lead us to suppose a natural order, but there are also many things which appear to be random: big numbers, the size of which cannot be explained, arrangements which appear arbitrary and which are not properly understood...

We still have a long way to go before we can teach this in school with a feeling we know what we are teaching.

Question: Is the Conference on the Peaceful Uses of Atomic Energy permanently in contact with CERN?

Professor Perrin: CERN has no connection with this Conference, which is

primarily concerned with the applications of atomic energy, whereas CERN is engaged in purely fundamental research. However, we have kept in touch; on the occasion of the second United Nations Conference, we announced the decay of the pi-meson into an electron and a neutrino.

In future the scientific results obtained at CERN will continue to interest those responsible for international co-operation in the atomic energy field, quite apart from any thought that practical applications will result from the scientific progress made at CERN.

It is certainly dangerous to say that no practical applications will ever emerge from activities which further our knowledge. In any event, research at CERN is in no way influenced by any idea of possible applications.

As regards the machine, its most important feature, in my opinion, is that it will create beams of "strange particles".

After the CERN machine has been running for a few years these should become well-known particles and I believe this is the essential qualitative gain we expect from this new accelerator.

Question: When will the machine be fully run in and how many hours a week are at present devoted to research?

Mr. Adams: At present the machine is working three days a week, three shifts a day, from 8.30 a.m. to 10 p.m. During two of these shifts, the afternoon and evening one, the machine is accelerated. The afternoon shifts are devoted to testing, and the evening ones to nuclear physics experiments. This timetable will be followed until the middle of the year, when we should have trained enough operators and be more familiar with the machine. Perhaps at the end of the year about six shifts will be available for experiments.

The newsmen had thus shown their interest in the scientists present and the scientific subjects in which they were expert.

There were still four hours to go before the official inauguration.

Correspondents and photographers were invited to spend part of this time visiting the synchrotron. About sixty guides from the PS placed their knowledge at the disposal of the journalists.

Their explanations helped the journalists to understand better the mysteries of the big accelerator; they were shown: the experimental hall, the linear accelerator, the inflector, the radial tunnels, the ejection system and the alternator room.

Finally, lunch was offered to the journalists and photographers attending the afternoon ceremony.



The official inauguration of the big CERN synchrotron took place at 3 p.m. on 5 February 1960. For all those responsible for disseminating the news it had in fact begun at 10 a.m., and in some cases even earlier.

For those in charge of organizing the ceremonies, it had really begun six weeks earlier, when the CERN Council, at its 14th Session, had set the date of the inauguration at 5 February. In the meantime, a thousand and one problems had had to be solved, such as those involved in issuing invitations to hundreds of scientific and diplomatic personalities... meeting and arranging transport for the most important of them... drafting and printing documents of all kinds, from the invitation cards to the inaugural brochure...

paring the PS South Experiment... preparing the PS South Experiment... recording the speeches and translating them, as well as a host of other papers stamped "urgent" ... marking out the routes to be followed by the visitors... receiving official guests... running the evening cocktail party, etc...

All those concerned closely or remotely with the success of this red letter day in CERN's history, felt a justifiable pride in helping to mark the achievement of their colleagues who had built the synchrotron.



"In a moment, I shall have the great honour to conclude the inaugural ceremony by pressing a button... with my warmest wishes that it may lead to new fruitful contributions to our knowledge and understanding of nature".

As he spoke those words, Professor Niels Bohr, the most senior of all the distinguished physicists assembled at CERN on 5 February, in fact pressed two buttons. One released a bottle of champagne suspended to the girders of the South Hall. The other put the lifting hook of the big travelling crane in motion. A moment later, the bottle of "Royal Brut" dropped down and crashed against the 15-ton concrete block. Slowly lifted by the crane, this block revealed a dark channel in the radiation shielding wall, through which high energy beams are to pass in future.

Professor Bohr's symbolic gesture marked the climax of a day which was the most memorable in the history of CERN: the official inauguration of the biggest particle accel-

tion, Arts and Science of the Netherlands, Lord Hailsham, Minister of Science of the United Kingdom, Mr. Medici, Minister of Education of Italy, and by Mr. Spühler, Head of the Swiss Department of Postal Services and Railways.

Many distinguished scientists were paying a special visit to CERN and among them were four Nobel Prize-winners for Physics: Professors P.M. S. Blackett, N. Bohr, W. Heisenberg and E. M. McMillan. Also present were Drs. M. Christofilos and Courant (United States) O. Dahl (Norway), and Profs. M. Danysz (Poland), J. Errera (Belgium), C. Gorter (Netherlands), L. Leprince-Ringuet (France), J.R. Oppenheimer (United States), P. Scherrer (Switzerland) and W. Thirring (Austria).

Among the Directors and representatives of International Organizations visiting Meyrin for the inauguration, were Prof. P. Auger (UNESCO), Dr. M. G. Candau (World Health Organization), Mr. S. Cole (International Atomic Energy Agency), Mr P. de Groote (Euratom), Mr.

The inauguration

erator, or biggest "atom-smasher", in the world, but also the largest and most costly scientific instrument ever commissioned for pure research.

Personalities present

Mr. François de Rose, President of the CERN Council, opened the proceedings by saying that certain personalities had sent in their apologies for being prevented from attending at the last moment: Mr. Max Petitpierre, President of the Swiss Confederation, Mr. Engen, Secretary of State at the Norwegian Ministry of Foreign Affairs, Mr. Harmel, Belgian Minister of Education, Mr. Joxe, French Minister of Education and Prof. Bogoliubov, a Russian scientist.

However, although some of the leading personalities, were unavoidably absent many of them had been able to come to CERN on that day, notably Professor Balke, Minister of Atomic Energy of the German Federal Republic, Mr. Cals, Minister of Educa-

P. Huet (European Atomic Energy Agency), Mr. D. Morse (International Labour Office) and Mr. P. Spinelli (European Office of the United Nations), as well as Mr. S. Stone, of the Ford Foundation.

Finally, about thirty firms who had played a part in the construction of the PS had sent representatives to the inauguration.

Mr. de Rose's speech

Altogether there were 300 distinguished guests as well as press representatives and the whole of the synchrotron team in the big PS Experimental Hall, where Mr. de Rose delivered the first of the inaugural speeches.

The main points of his speech were as follows:

"Ministers,

First of all, I should like to express to you my gratitude for attending this ceremony. Your presence, that of the Presidents or Secretaries-Ge-