
DATA COMPILATION Protocol signed

CERN and other high energy Laboratories produce enormous quantities of data and results. The main results are written up and published; reviewers, conference rapporteurs and textbook authors compile them and present them in a digested form. But much experimental data is so voluminous and indigestible that it escapes this process.

Even though they are very important, specific reaction rates (cross-sections) are of this type. Recognizing the need to present as many results as possible, an informal international organization has gradually evolved and has been recognized officially by a protocol signed in 1986 between CERN, representing Western European groups, and the Soviet Union.

Compilations of many interaction cross-sections started in 1966 when Douglas Morrison made a

study of two-body cross-sections for a conference in Stony Brook. The aim was to derive physics insight from the data (the cross-sections decreased with momentum by a power law and the power was dependent on the quantum numbers exchanged). So as not to waste this data compilation, other physicists were invited to join and an organization to compile cross-section data was set up in 1967. It was named HERA for High Energy Reaction Analysis. Several people agreed to compile different types of reaction. To allow easy access, the compilations have been issued in book form as CERN-HERA reports, and about a dozen reports plus updates have been issued. An agreement was made with the Particle Data Group, set up by Art Rosenfeld and based in Berkeley, to share the publication of HERA cross-section compilations and PDG compilations of other data. Postal costs are reduced by Berkeley being responsible for distribution in North and South America, Australasia and the Far East while CERN serves all other areas.

The HERA group has regular meetings with other European groups and reports are given at the CODATA conferences (a UN associated organization). In the UK, differential as well as total cross-sections are compiled and with the much greater volume of data, the compilation is made available to the community through a computer network — further information and details on how to access the data can be obtained from Mike Whalley at Rutherford or Durham. At Serpukhov (USSR) a strong theory group began collecting cross-section data and has set up the COMPAS organization. For some time tapes have been exchanged between the HERA, COMPAS and UK organizations and in 1986 this was formalized in a protocol signed by CERN and by the USSR. The coordinator of the work of this joint organization is Vincenzo Flaminio of Pisa. Groups at Bologna, CERN, Durham, ITEP (Moscow), Pisa, Rutherford and Serpukhov are members.

By Douglas Morrison

CERN makes history

A thriving international Laboratory with over thirty years of history and tradition behind it can look to the past as well as to the future. The first volume of an authoritative two-volume history about the creation and early years of CERN, published in February, traces the events leading to the coming into force of the Convention establishing the Laboratory in 1954.

A team of European historians

began work on the CERN History towards the end of 1982 following the initiative of Gunther Lehr, Federal Germany's delegate in the CERN Committee of Council. The historians are led by Armin Hermann, Professor of the History of Science and Technology at Stuttgart, and included John Krige from the UK, Ulrike Mersits from Austria, and Dominique Pestre from France, helped part-time by Lan-

franco Belloni from Italy and Laura Weiss from Switzerland. At CERN, Alfred Gunther helped the study along while Roswitha Rahmy and Yves Felt provided invaluable help from the CERN archives. The project also benefited from input from an Advisory Committee chaired by P. Levaux.

The two main threads in the lead-up to the creation of CERN — the physics and the politics — are

reflected in the first volume of the CERN History, with a wealth of information.

Preparing the way

The historians outline the formative years: 'Towards the very end of 1949, in the aftermath of President Truman's announcement of the explosion of the first Soviet atomic bomb, several personalities associated with nuclear matters in Europe began to think seriously about the possibilities for multinational co-operation in this area. The most important of the first initiatives was that of Raoul Dautry, Administrator-General of the French Commissariat à l'Energie Atomique. At the European Cultural Conference in Lausanne in December 1949 he had a resolution passed recommending that studies be undertaken for the creation of a European institute for nuclear science 'directed towards applications in everyday life'. Six months later Isidor I. Rabi, American Nobel prizewinner and co-founder of the Brookhaven National Laboratory, put a resolution to the annual conference of UNESCO. It invited the states who so wished to create one or more regional European laboratories, including one in nuclear science. This was adopted by the General Assembly on 7 June 1950.

Two small groups took up these proposals in the following months. One comprised a handful of specialists in classical nuclear physics (people like Kowarski in France or Preiswerk in Switzerland), or in cosmic rays (most notably, of course, Amaldi in Italy and Auger in France, the latter also being Director of UNESCO's Department of Exact and Natural Sciences).



Previously unpublished photographs showing many of CERN's founders gathered for the Third Session of the provisional CERN Council in Amsterdam on 4 October 1952. (Photos Lindeman, Amsterdam)

The other group was composed of three important administrators of science — Raoul Dautry, Gustavo Colonnetti (who was President of the Italian Consiglio Nazionale delle Ricerche), and Jean Willems (Director of the Belgian Fonds National de la Recherche Scientifique). In December 1950 a first gathering of scientists and administrators organized by Auger and Dautry at the seat of the Centre Européen de la Culture in Geneva proposed that the biggest accelerator in the world (i.e. about 6 GeV) be constructed. A reactor was ruled out for political reasons, notably the problems posed by industrial applications and military interests.

In May, October, and November of the following year (1951) Auger, along with a number of scientific consultants, further refined the project advocated in Geneva. In December 1951 their recommendations were submitted to a European intergovernmental conference officially called by UNESCO, but in fact orchestrated by Auger himself. After lengthy discussions which reflected serious differences of opinion among scientists, the con-

ference proposed that a provisional organization be established. It was endowed with \$200 000 and given 18 months to present potential member states with worked out technical, organizational, and financial plans. The formal Agreement embodying these proposals was signed on 15 February 1952 by all those present, with the exception of the United Kingdom. Early in May, with the \$200 000 guaranteed, and five signatures ratified, the Agreement entered into force.

On 5 May 1952 the provisional Council met for the first time. The technical groups to design the accelerators and plan the laboratory were set up. In October Geneva was adopted as the site for the laboratory, and it was decided to construct a 25-30 GeV proton synchrotron embodying the new alternating-gradient principle. This meant that a research and development effort — with its associated risks — was needed, and that the machine would take some five or six years to build. In January 1953 the British government was represented officially in the Council for the first time, and the



discussion of the text of the Convention establishing the permanent organization began in earnest. On 1 July 1953 this Convention was signed by eight of the eleven member states of the provisional CERN and by the United Kingdom.

A period of waiting ensued. The last two ratifications needed for the Convention to enter into force were deposited some 15 months later on 29 September 1954. During the hiatus much was done: around October 1953 the group designing the big accelerator was installed in Geneva, and an embryonic administrative structure was set up; from January to March 1954 protracted and complex negotiations around the top post of Director-General led to the nomination of Felix Bloch in April; in May excavation work began on the site at Meyrin. In summary, during the 15-month interim period, the organization asked for, and got, 9.2 million Swiss francs from the member states, the scientific groups expanded steadily (numbering some 120 people gathered from all over Europe in September 1954), and the work pro-

ceeded to such an extent that, when the Council of the permanent organization first met on 7 October 1954, it was asked to approve the award of major building and technical contracts.'

Interpreting the motivation for CERN

The 'standard model' of the motivations behind these events is that the physics community's requirements for fundamental research outstripped national financing, and that, in consort, receptive politicians were looking for ways to rebuild war-torn Europe.

The historians agree that, as a first approximation, these motivations were widely at work in the creation of CERN. They illustrate, however, that the physicists were far from unanimous in their vision of the best path to follow, and the pro-European spirit amongst politicians was not as widespread as has been maintained. There were 'several groups of actors, several forces at work, each having its own interests' and there was an

'element of conjunctural coincidence involved in the birth of the Organization'.

The concluding chapter summarizes how these diverse interests were gradually reconciled so that the viewpoint of Edoardo Amaldi and Pierre Auger amongst the scientists, and of Gustavo Colonetti, Raoul Dautry and Jean Willem amongst the politicians, eventually prevailed. The authors also deal with the aims of the American support for the new European Laboratory and discuss some early perceptions of CERN as a potential source of directly exploitable discoveries.

This first volume is a scholarly study comprising some 550 pages. A second volume, on the years of the Proton Synchrotron construction and operation, through to the authorization for the Intersecting Storage Rings, will be published in about a year. A condensed 'popular' edition will also be prepared. 'Launching the European Organization for Nuclear Research' is published by North Holland Physics Publishing, a division of Elsevier Science Publishers, P.O. Box 103, 1000 AC Amsterdam, The Netherlands. The sole distributor for the USA and Canada is Elsevier Science Publishing Company, 52 Vanderbilt Avenue, New York, NY 10017, USA.

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