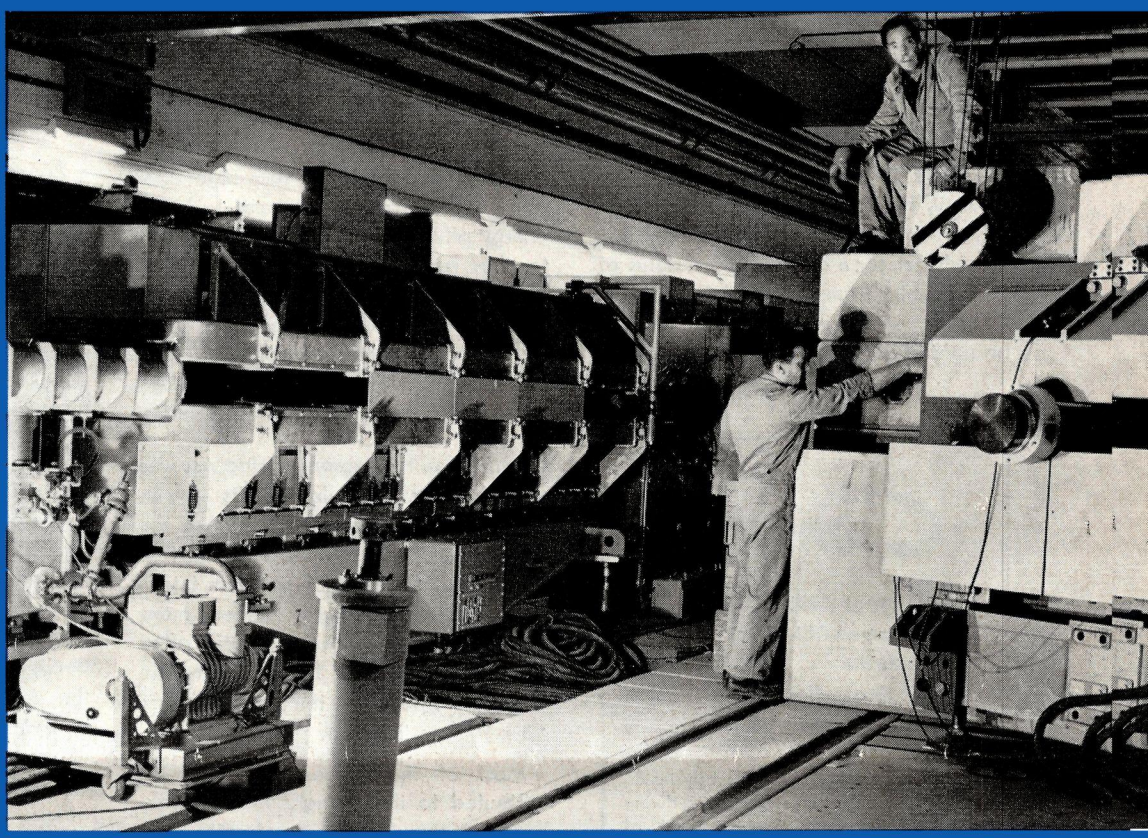
CERN COURIER



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VOL. 2

July 1962

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

The European Organization for Nuclear Research (CERN) came into being in 1954 as a co-operative enterprise among European governments in order to regain a first-rank position in nuclear science. At present it is supported by 13 Member States, with contributions according to their national revenues: Austria (1.90%), Belgium (4.07), Denmark (1.95), Federal Republic of Germany (19.15), France (20.81), Greece (0.60), Italy (9.90), Netherlands (3.77), Norway (1.58), Spain (4.21), Sweden (4.15), Switzerland (3.23), United Kingdom (24.68).
The budget for 1962 is 78 million Swiss francs.

The character and aims of the Organization are defined in its Convention as follows:

'The Organization shall provide for collaboration among European States in nuclear research of a pure scientific and fundamental character, and in research essentially related thereto. The Organization shall have no concern with work for military requirements and the results of its experimental and theoretical work shall be published or otherwise made generally available.'

Last month at CERN

At the 21st Session of the CERN Council, held on 13 June (see p. 4), a formal application by **Yugoslavia** was considered, for a change in the status of their country from that of Member State to that of Observer. This request, brought about by Yugoslavia's continued difficulty in devoting a very high proportion of its scarce resources to high-energy physics, was unanimously agreed to, thus reducing the number of CERN Member States to 13. Their country's new status will not affect the nine Jugoslavs at present employed at CERN, but any who wish to work here in future will have to come as Visiting Scientists.

On 5 June the **proton synchrotron** was started up on schedule after its 4-week shut-down, and soon showed that the various improvements made during that period had been effective. Beam intensities were significantly higher, more than 5 x 10^{11} particles per pulse often being obtained, and for one complete week of operation the average was 4.3 x 10^{11} particles per pulse.

Most of the improvement can be attributed to the changes made in the **linac** injector for the accelerator. The installation of new quadrupole lenses after the pre-injector, and steering coils near the ion source, resulted in an increase in the current delivered by the linac to 20 mA, an achievement that was duly celebrated by the Linac Group on the evening of 4 June.

The large amount of work that had gone into the construction of the two new **beams** in the North hall of the proton synchrotron was well rewarded, both giving excellent results as soon as they were put into operation.

One of them, known as a_2, was designed by a team drawn from the Nuclear Physics, Synchro-cyclotron, Track Chambers, and Proton Synchrotron Divisions, to provide particles for counter experiments in strange-particle physics. At present the beam is being used to complete the Argonne spark-chamber experiment, and it has also been used for nuclear chemistry. It gives positive or negative **pions** at the rate of several million per machine pulse, or some tens of thousands of positive or negative **kaons** per pulse, well focused, with momenta up to 3 GeV/c. To do this, particles need to be collected at a very small angle to the internal proton beam, so that the first beam magnet had to be put as close to the accelerator vacuum tank as possible. In fact the first two magnets, which have both focusing and bending properties, were specially designed for this beam, the first magnet fitting closely round a specially shaped target section of the vacuum tank.

The other beam, known as k_2, provides separated positive or negative **kaons** of low energy for experiments in hydrogen or heavy-liquid bubble chambers. It can also be used to give antiprotons. Because of the large loss arising from the decay of slow kaons in flight, the beam must accept rather large numbers of particles as well as provide good separation of the kaons from all the others. The beam was designed and constructed by members of the Track Chambers Division, together with visitors from the École Polytechnique (Paris) and elsewhere. Apart from the usual magnets and lenses, two electrostatic separators are incorporated, one on loan from Saclay and one from Padua. The beam performed more or less as predicted and is at present being used for an experiment in the École Polytechnique heavy-liquid bubble chamber, with positive kaons of momentum 800 MeV/c.

On 28 June the first of the magnet coils arrived for the **CERN 2-m hydrogen bubble chamber** now being erected in the East bubble-chamber building. The magnet yoke was completed some time ago, and has since been fitted with hydraulic supporting jacks and its electrically driven wheels, running on parallel tracks, which will enable the two halves of the magnet to be drawn apart when necessary. The bridge from which the chamber body will be supported has also been mounted on its wheels. Movement of both the bridge and magnet has been tested, as well as the

Continued on page 6

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The cover photograph was taken inside the proton-synchrotron ring building during the May shut-down. To the right of L. Marrer and P. Richard a bending magnet of the new beam a_2 can be seen, while to their left is one of the 100 magnet sections of the accelerator. On the extreme left, a pumping station and part of the target box for the old beam k_1 is visible. An article on the PS shut-down begins on p. 4.

Photo credits: all photos by CERN/PIO.

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21st Session of CERN Council

The CERN Council held its 21st Session on 13 June, when forty-one delegates and advisers, from 13 Member States and 2 countries having the status of Observer, took part under the presidency of Mr. Jean Willems (Belgium).

Among the items discussed were the following :

Status of Yugoslavia

Yugoslavia, one of the Organization's founder members, formally requested that its status should be changed to that of an observer, and the Council unanimously agreed to this. The country's position is explained by its need to strike a better balance between the financial effort for research on a national plane and the effort devoted on an international plane to nuclear-physics research.

Replying to the Yugoslav delegate, Mr. Anastasijevic, the President of the CERN Council stressed the very close ties which would continue to link Yugoslavia and CERN.

Programme and budget

A preliminary discussion was held on the report on the CERN programme and budget drawn up by a working party under the direction of Mr. J.H. Bannier, Director of the Netherlands Organization for the Development of Pure Research (Z.W.O.). Instructions were then given for CERN to draft a budget for 1963 in the spirit of the Report, which proposes a procedure for future long-term planning and budgeting and envisages a rate of growth of between 10 and 14 %. The report itself will be presented again for formal approval in December.

Progress report

The CERN progress report for the first six months of 1962 was presented by Prof. V.F. Weisskopf, the Director-general. Speaking of the CERN synchro-cyclotron he said : 'the fame of the Organization is at present still based on work performed with the small accelerator of 600 MeV, one of CERN's jewels'. In talking about the 28 000-MeV synchrotron, he mentioned a number of possibilities given recently by this machine, for example the construction of beams that permitted the simultaneous use of two bubble chambers, and the greater intensity of the accelerated proton beam that was being regularly obtained (since then, there have been further increases).

The Director-general reported that experiments with track chambers and with electronic counters occupy about equal time on the large accelerator, with some 10 % of the total time given to experiments using nuclear emulsions. 'We are carrying out here more experiments with counters and emulsions than any other laboratory in the world', said Prof. Weisskopf, emphasizing that physicists in Europe have been familiar with these techniques for a long time.

New Directorate Member for Research

The Council elected Prof. Gianpietro Puppi as Directorate Member for Research, to replace Prof. Gilberto Bernardini, who will return to his former chair of Physics at the University of Rome at the beginning of next spring.

Prof. Puppi was born on 20 November 1917 in Bologna. He is the Director of the Institute of Physics of the University of Bologna and Vice-president of INFN (the Italian National Institute for Nuclear Physics). His publications cover cosmic rays, elementary particles, and universal weak interactions.

Professional and scientific training at CERN

A further subject for discussion was the rôle of CERN in education. The principle of professional training for technicians was approved, as well as some extension of the lectures and seminars given regularly at CERN for the scientific personnel. Mr. André Chavanne, one of the Swiss Delegates, stated that the technical-education establishments in Geneva would give every help within their means to the CERN programme.

Ford Foundation funds

The use of funds received from the Ford Foundation was described by the Director-general, who pointed out that in 1961, 44 Visiting Scientists from outside the Organization had worked in six of its Divisions. Since 1954 the Foundation has allocated a total of 900 000 dollars for the remuneration of physicists wishing to work at CERN but not belonging to a Member State. At the end of 1961 there were representatives of Brazil, Israel (2), Korea, Pakistan, Poland (4), South Africa, and the United States (10) at Meyrin, financed by the Foundation ●

PARTICIPANTS

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Mr. H. Gleissner *

Belgium
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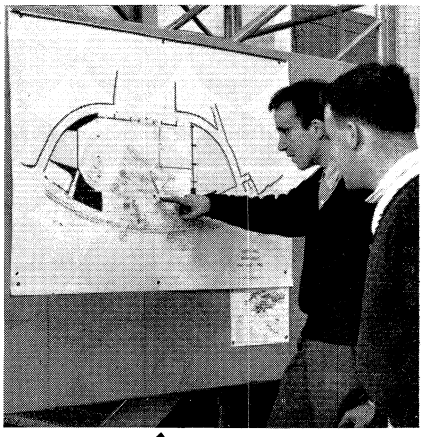
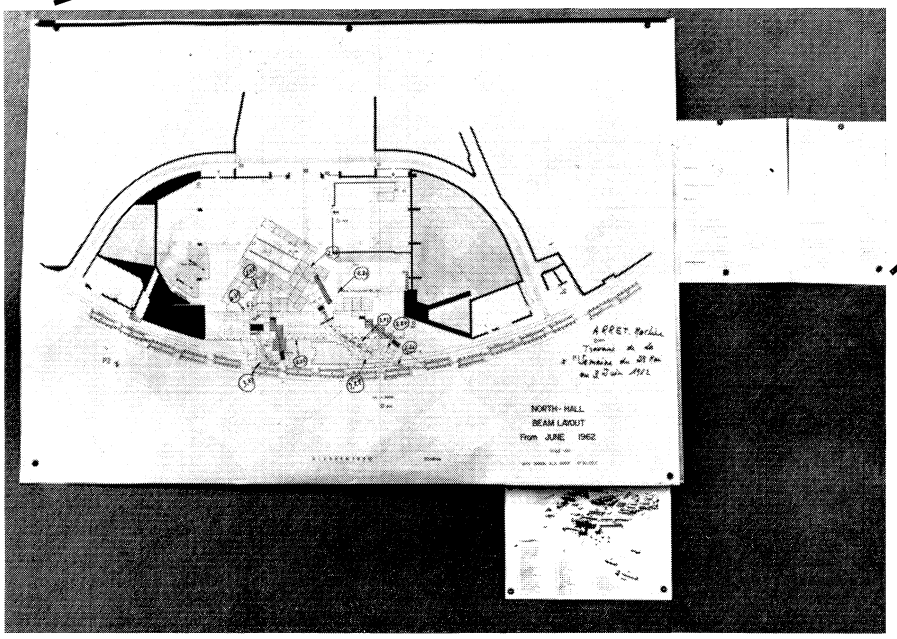
Mr. P. Anastasijevic **(Jugoslavia)**
Mr. S. Soc **(Jugoslavia)**

Mr. R. G. Elkington, Prof. D. A. Durán, Mr. C. Seippel, Mr. Ph. Wacrenier and Mr. W. Baumann attended as guests. The chairman of the Scientific Policy Committee and the Director-general, Directorate Members and Division Leaders of the Organization were present ex officio.

* Adviser
** Alternate

PS Shut-down





One aspect of the work of many groups : M. Rollier and J. C. Lambert study one of the beam layout plans displayed in the North experimental hall during the PS shut-down in May.

On the plan, which shows the two new beams to be constructed in the North hall, various phases of the week's work are indicated, with numbers referring to sub-paragraphs of the adjoining detailed schedule.

From 6 May until 5 June there was a scheduled shut-down of CERN's 28-GeV proton synchrotron, for maintenance, modification, and change of beams. Why and how are explained in the article below, compiled from information given by P. H. Standley, Deputy Division Leader of the MPS Division.

At present the proton synchrotron (PS) normally runs continuously each week from 3.30 p.m. on Tuesday until 11.00 p.m. on Saturday. The greater part of this time is devoted to nuclear-physics experiments, although some 10 hours per week are reserved for 'Machine development', that is tests and experimental work directed towards improvements in the machine itself.

At the beginning of each week, there are about one and a half days (all of Monday, Tuesday morning, and perhaps also part of Sunday) when changes in the beam layout are made for the experimental programme. During this time, also, routine maintenance and the less drastic development work are carried out. Some things, however, cannot be done in so short a time. A new beam may take a week or more to construct ; certain maintenance work requires more than two days for completion, and cannot usefully be spread over several week-ends ; some improvements to the machine, and particularly the opening up of a new experimental area, may require uninterrupted periods of several weeks for the work to be carried out.

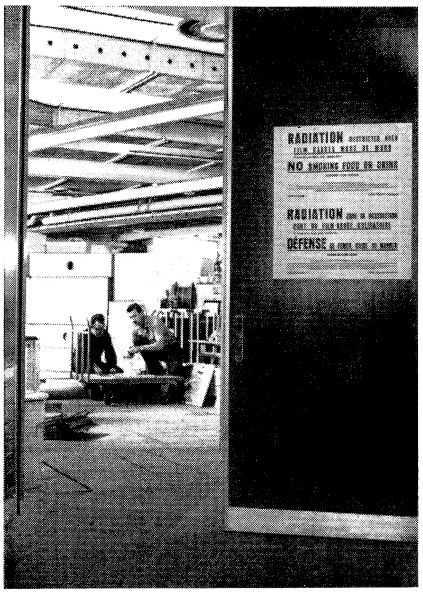
Periodically, then, normal running of the synchrotron has to be halted. This year — an exceptional one, owing to the large amount of work involved in preparing the new East experimental area — three such shut-downs are planned. The first was from 23 December 1961 until 16 January (including one week for the Christmas holiday), and the second during the four weeks from 6 May to 5 June. A longer one, of eight weeks duration, is scheduled to start on 27 August, to allow the major work of opening up the East junction to be carried out.

DECIDING THE DATE

Who decides when the machine shall be stopped, and how is the decision made ? These questions are not easily answered, since the reasons for any two shut-downs are never the same. Generally speaking, though, the leaders of the various groups in the MPS Division know some six to twelve months in advance that certain necessary work can only be done during a shut-down. At the same time, the physicists, and in particular the Nuclear Physics Research Committee, have a long list of experiments waiting to be done, with recommendations on priority, from which their various beam requirements can be planned, again some months ahead.

Since it is to everyone's advantage to concentrate this major work, on both beams and machine, into a forthcoming shut-down period, a continuing process of consultation and discussion takes place, in the course of which the date and duration of the shut-down are first arrived at tentatively and then finally fixed. At this stage, a complete list of work to be done is compiled, ensuring that the time is used to best advantage.

In the absence of any other reason, the normal machine schedule would need to be interrupted every three or four months for routine maintenance. Usually, in fact, other reasons do appear, and it is generally



Strict safety precautions are taken to prevent any possible danger from residual radioactivity of the accelerator. No-one is allowed inside the ring building without a film badge for recording exposure to gamma radiation, and all work within the limits of the ring foundation beam requires special permission. Notices are displayed, in CERN's two official languages, at all entrances, and the rules are enforced by Health Physics technicians. Beyond the door, here, are R. Nagy and F. Reiser, at work on the loudspeaker warning system.

SOME OF THE JOBS SCHEDULED FOR THE MAY SHUT-DOWN
(groups responsible in brackets)

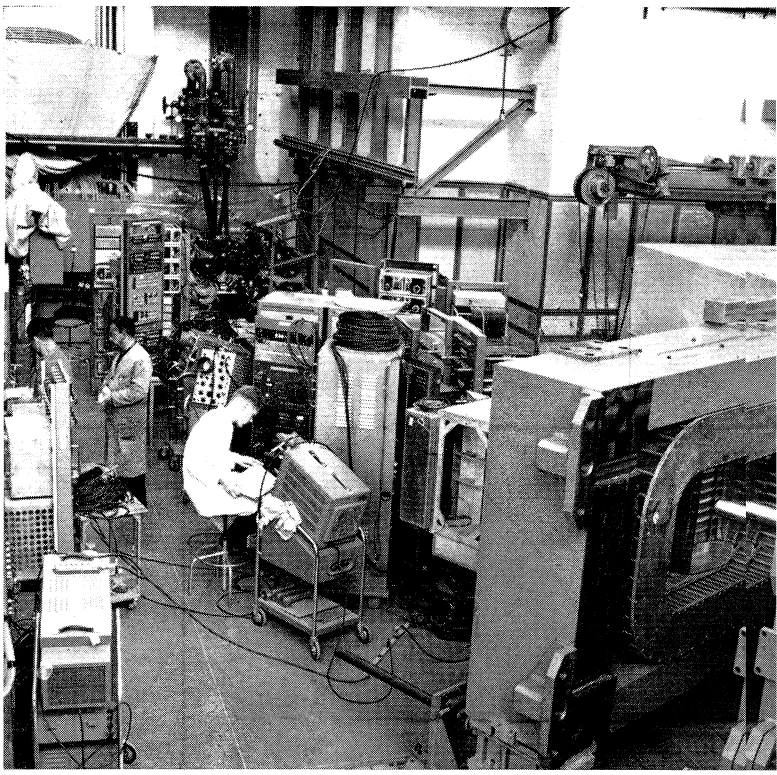
- **Setting up of new beams k_2, a_2, reinstallation of beam d_8. (Apparatus layout)**
- **Installation of special tank in straight-section No. 82, for rapid change of nuclear-chemistry targets. (Vacuum)**
- **Installation of two new triplet quadrupole magnetic 'lenses' after the pre-injector of the linac. (Linac)**
- **Modification of the generators for track-chamber magnets in the South Generator Building, to give better regulation and improve their reliability. (Power, and Engineering Division)**
- **Maintenance of all TV equipment and telecommunication amplifiers; installation of remaining loudspeakers in ring area, remote-control system for beam stoppers, etc. (Controls)**
- **Installation of electronic filter in the filter room of the Power House, to eliminate ripple on the 'flat-top' of the magnet current pulse and hence radial 'jitter' on the beam. (Radiofrequency and Power)**
- **Construction of foundations in straight-sections Nos. 1 and 97, in preparation for installation of the beam-ejection systems. (Radiofrequency, ALO, and Vacuum, with Site and Buildings and Nuclear Physics Apparatus Divisions)**
- **Civil engineering work at the East junction. (Site and Buildings Division)**
- **Setting up of 5 000-A d.c. distribution system to supply more track chambers in the North hall. (Engineering Division)**

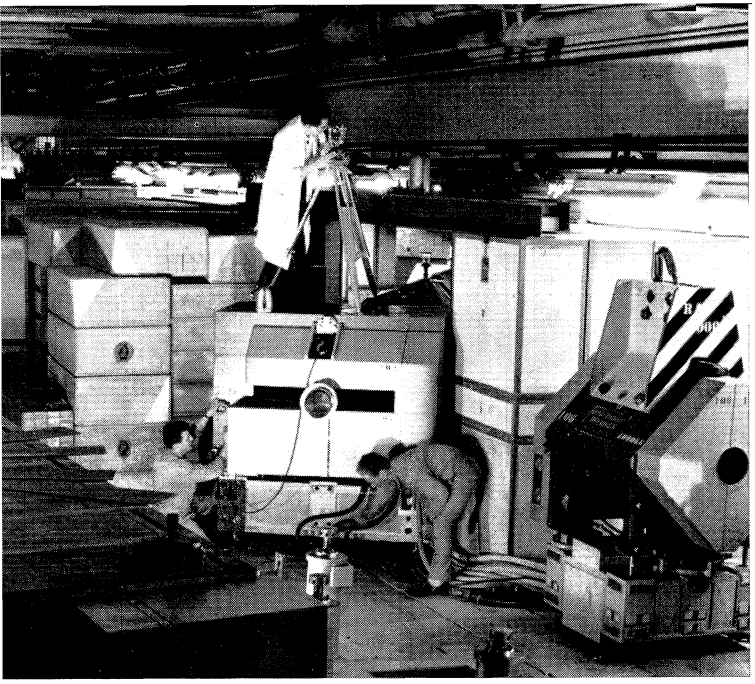
found that one particular set of circumstances is sufficiently more important to fix by itself the date or period of the shut-down, or both. For instance, in May the determining factor was the civil engineering requirements for the East junction. Before the East experimental area could be roofed, a concrete supporting wall was required at the junction with the accelerator ring. Much of this work could be done only during a shut-down, as it entailed removing part of the radiation shielding over the ring ; since the contract had been made for roofing to begin in June, this shut-down had to be in May at the latest. It was anticipated that two new particle beams would be constructed at this time, but to allow as much use as possible of the existing beams it was desirable to delay the change as long as possible. Thus the shut-down was eventually fixed for May itself.

AND THE DURATION

The civil engineering work was estimated to require three weeks to complete, and at first it seemed that the beam changes and other work could be done in this space of time. The decision to add another beam meant that a further week was needed, and the beam construction therefore became the deciding factor. Thus the length of the shut-down was fixed at four weeks, and such other work was scheduled as could be carried out in this period.

Some idea of the amount of experimental equipment that may have to be moved around when changing a beam may be gathered from this picture. In the right foreground the dismantled magnet for the Argonne Group's spark chamber can be seen, while the rest of the photograph is taken up with connecting cables and electronic apparatus for the triggering and control circuits. All this had to be moved from its position in the old a_1 beam to its new one in the a_2 beam. A. Combet, R. Jacquin and L. Niemela are here at work checking some of this equipment.





L. Marrer, L. Grandclement and P. Richard at work on the positioning of a bending magnet in the new beam a_2. All components for forming the beam must be aligned with a high degree of accuracy and a great deal of effort is involved. For instance, construction of this beam included :

a) dismantling of the old beam a_1 (shielding inside and outside the ring, 3 magnets and 7 lenses, Argonne chamber, etc.);
b) installation of the new beam a_2 (shielding, 5 magnets and 3 lenses, Argonne chamber, special vacuum tank in straight-section 6, vacuum pipes, etc.);
c) electrical interlock between beam transport and main control room.

The next shut-down is at present determined largely by the programme for commissioning the East area and by the experimental programme in general. Major work foreseen is the installation of special vacuum chambers in two magnet units and three straight sections, for the fast and slow beam-ejection systems, and the opening of the tunnel wall at the East junction. Although originally envisaged to begin in the middle of July, this shut-down is now expected to be for about eight weeks from the end of August, this period being more convenient from the point of view of the experimental programme and of staff holidays.

WORK TO BE DONE

It has been explained that once the date and duration of a shut-down have been fixed it is advisable to concentrate as much work as possible into it. How is this arranged ?

Each group in the MPS Division keeps a list of the maintenance work that is necessary, this list being constantly brought up to date. Many jobs can be carried out during the normal period each week when the machine is not running. For example a spare pick-up station enables each one round the ring to be removed for maintenance at the beginning of one week and replaced the next. Such work is of little importance from the shut-down point of view.

At the other extreme, it must be remembered that two or more jobs scheduled for a shut-down period may clash with each other. It is no use trying to lay new cables in the floor ducts while a new shielding wall is being built on top of them. Therefore, once a month Robert Gouiran, engineer in charge of the 'floor' work of the Apparatus layout (ALO) group, collects together information from all the groups and produces a list which is discussed by the Deputy Division Leader, Peter Standley, and the heads of the three groups most concerned — Franco Bonaudi (ALO), Giorgio Brianti (Controls) and Milan Georgijevic (Power and magnet). Others, such as Gordon Munday (Experimental planning group), Bernard Hyams, (experiments co-ordinator in the Nuclear Physics Division), and of course Pierre Germain, the Division Leader, are consulted or kept informed of decisions. Yet more information and ideas come from other committee meetings that are attended by the group leaders, and from personal conversations.

From the work lists, discussions, and varied sources, the first vague ideas on future shut-downs evolve until the date, duration, and programme of work to be done are all settled. Finally, when the time comes, everything must go smoothly to ensure that experiments can be resumed on the day decided ●

Last month at CERN (cont.)

special joints in the bridge supports that ensure vertical alignement of the wheels under all conditions of loading. Further progress has been made with the hydrogen refrigeration system, including installation of the compressor.

Another event in June connected with the new bubble chambers was the sucessful pressure testing of the **hydrogen safety sphere.** Some 520 tons of water were forced into the 10-m-diameter steel vessel to produce a pressure of 24 atmospheres. A novel, if somewhat exacting, way of carrying out his final examination was chosen by the Inspector from the 'Association suisse de propriétaires de chaudières à vapeur', who spent several hours floating in an inflatable dinghy to check the whole of the inside surface as the water was drained away.

On 1 June, the **Engineering Workshop** was transferred from the **Engineering Division** to the **Site and Buildings Division,** to improve co-ordination with the Main Workshop and enable work to be shared more effectively. In addition, most members of the Mechanical Group will be 'loaned' to other Divisions, to whom they will be directly responsible, though administratively they will remain part of the Engineering Division. A new Mechanical Section is being formed to study special design problems. The Electrical Engineering Group will be expanded, and among other responsibilities will deal with all future electric sub-stations on the site.

These changes have been brought about largely by changing needs. During 1961 and the first half of 1962, the Engineering Division has concentrated on the planning, ordering and erection of the various services required in the East experimental area of the proton synchrotron. The completion of the installation work is now drawing near, and most of the facilities will be available to other Division during the second half of this year.

In June, 13 **motor generator sets** for beam-transport magnets, with a total output of 4,3 MW, were tested. A first trial run of the large motor-generator

WHO'S WHO IN CERN

Gilberto BERNARDINI

Directorate Member for Research

Among the things learned at the Council Meeting on 13 June was the news that Prof. Gilberto Bernardini is to leave CERN next year. Thus the Organization will lose one of its senior members, who has been with it since its earlier days.

Gilberto Bernardini was born in the Italian city of Firenze (Florence), in 1906, and received his early education at the 'Scuola Normale Superiore' in Pisa. He did not at first intend to become a physicist, but did so in time to be caught up in the excitement and progress of the years following the discovery of the neutron. Some of his early research work was on the production of neutrons by the action on beryllium of alpha particles from polonium, and the interactions of the neutrons with other elements.

In 1938 he was appointed Assistant Professor at the University of Florence, and in 1939 Professor at the University of Bologna. By this time he was doing experiments on cosmic rays, using Geiger counters and coincidence methods, first to study the various components of the radiation and then to measure the lifetime of the cosmic-ray mesons (muons). This work was continued using the new techniques of nuclear emulsions and high-altitude balloons, after his appointment as Professor at the University of Rome in 1946.

Gravitating to the United States, like so many others at that time in search of the most up-to-date facilities, he went as Visiting Professor of Physics to Columbia University in 1950, where he investigated the scattering of pions on nuclei, and nucleonic cascades, using the Nevis cyclotron. There too he learnt from I. I. Rabi of the very early moves towards the creation of CERN, and played an active part in spreading the movement among his fellow countrymen in the U.S. and in Italy. From 1951 to 1956 he was Research Professor at the University of Illinois; among his experiments there he studied the production of photopions just above threshold, using secondary gamma rays from the 300-MeV betatron, to measure the pion-nucleon interaction constant.

When the time came at CERN to prepare experiments, in 1956, he came back to Europe, as Director of Research in the Synchro-cyclotron Division. It seemed obvious to him that the best way to use the 600-MeV accelerator was not just as a training ground for the big machine that was to come later, but to enlarge and extend the work done with similar cyclotrons by carrying out very careful high-precision experiments on problems of particular theoretical interest. The policy that he established then, and continued when he became Director of the Division in 1958, has been amply justified by the number of important results obtained, particularly those concerning the properties of the muon.

In January 1961 the CERN reorganization resulted in his appointment as Directorate Member for Research. By then he was already feeling that he had been long enough at CERN, and that he ought to obey the call to return to his University post and to the more individualistic life that he preferred, but he was persuaded to stay longer. His task on the Directorate, with the various experimental committees on the one hand and the Scientific Policy Committee on the other, is that of guiding the experimental programme in the most fruitful direction. The vast field of study that high-energy physics has now become and the heavy expense of so many of the possible experiments are only two factors that make this an almost superhuman task. How well his irrepressible energy, imagination and devotion to physics enable Prof. Bernardini to tackle it can be appreciated to the full only by those who work with him ●

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sets for powering the magnet of the CERN 2-metre hydrogen bubble chamber, and for other track chambers, is planned for July, and a 10-MW cooling system for beam-transport and track-chamber magnets will be commissioned. The installation of other equipment, such as d.c. distribution systems, remote-control and current-measuring systems, demineralized-water distribution pipework etc., is also far advanced.

Also in June, **A. H. Achermann,** head of the Mechanical Engineering Group, presented a paper on 'Rubber supports for the transport of heavy loads' to a conference on 'Modern Rail Transport' held at Graz, in Austria. **J. J. Hirsbrunner** returned from the 'National Institute for Research in Nuclear Science', England, where he has spent six months working on the 1.5-m bubble chamber and on the Nimrod accelerator. Representatives of a German company came to inspect the facilities for making and transporting **concrete blocks** on the CERN site, with a view to using the same methods for the movable shielding of the DESY accelerator at Hamburg.

A good start was made with a new series of **public lectures** in Geneva on Wednesday, 27 June, when Professor **J. Robert Oppenheimer,** Director of the Institute for Advanced Study in Princeton, U.S.A., delivered an address on 'Science and Culture'. The main lecture hall of the University was crowded, together with several other rooms where the talk was received by means of television and loudspeaker. This series of lectures, under the general title 'Science and Society', is being organized jointly by the International Labour Office, the World Health Organization, the World Meteorological Organization, the University of Geneva, and CERN, whose Director-general, Prof. V. F. Weisskopf, was responsible for the idea.

Saturday 2 June was a record day for **visitors,** 528 of them coming for a 1½-hour tour of the site, preceded by an introductory talk and showing of the CERN film 'Matter in Question'. The 'Services Industriels' of Geneva were the first to arrive, followed by a group of 260 Government civil engineers from France. In the afternoon came members of the 'Nederlandsche Vereniging'

Continued on page 8

BOOKS

In his preface, Eibert H. Bunte, the author of **Between stars and atoms** (London : Michael Joseph, 21s.) states that his book 'is written for the baker, the business man, the accountant and the shorthand typist', adding : 'the expert and the already interested layman can leave it unread without any scruples. They, however, form a small minority'. It is thus an introduction to scientific knowledge, neither text-book nor science fiction, but a 'translation' of 'the most important facts and suppositions concerning modern science... into simple words comprehensible to everyone'.

This claim has, of course, been made many times before. One may well ask if this book is better than the others, but the better question is 'does it fulfil its self-appointed task ?' On the whole, one would say it does, the only qualification being that such a book can deal only with some of 'the most important facts' rather than all of them. These facts, as the title implies, come largely from the fields of space research and nuclear physics: the very large and the very small. The author returns many times to the subject of size, with many interesting examples in his attempt to make really comprehensible the vastness of the universe or the minuteness of the atomic nucleus. In fact the whole book is refreshingly straightforward in approach, emphasizing basic ideas or ways of thought rather than the detailed applications of science in technology. In this way too, the essential 'openness' of scientific knowledge, the feeling that it will never be complete, is demonstrated, and even the controversy and disagreement that can exist among scientists concerning a specific theory (three possible answers are given for the 'age' of the high-speed space traveller compared to that of the man who stays at home, each with reasons !).

Among the topics discussed are the earth and moon, gravity, eclipses, the sun's planetary system, meteors, comets, stars and galaxies, are we alone in space ? ; space and time, and relativity, how far can we travel in space ? ; the 'philosopher's stone', atoms and radioactivity, neutrons and nuclear reactors, nuclear fusion and unlimited fuel ; elementary particles, high-energy physics and the apparatus used in its study ; probability ; how the universe began, and how it might end.

There are a few mistakes, some of which cannot be completely explained away by the need for simplicity, but on the whole they are outweighed by the interesting, easily read text, translated from the original Dutch by Ian F. Finlay. In spite of the statement in the preface, even the initiated might find some new ideas ; the typists and business men for whom the book was written will not find out how an atomic bomb works, but they may gain an insight into something that is really more important — how 'science' looks at the universe and how it goes about the problem of discovering its secrets.

A.G.H.

The **Annuaire-guide international de l'énergie atomique et des autres énergies, 1962** (Paris, Olivier Lesourd is the latest edition of the former 'Guide de l'énergie'.

Primarily a reference book for those interested in the supply of energy in France, its 400 pages are divided into seven thumb-indexed sections : equipment, general information, atomic energy, coal, electricity, liquid fuels, and gas.

The first section is a comprehensive 'buyers guide', with names and addresses of suppliers of material listed under some 200 sub-headings. Further information appears in the form of advertisements and 'notices techniques'. The next twenty pages are devoted to international bodies concerned with energy in general, similar French organizations, and attemps being made throughout the world to harness new sources of energy. In the third section (the longest) articles on 'European industry and the atom' and 'European co-operation in the development of atomic energy' are followed by information on the International Atomic Energy Agency, the European Nuclear Energy Agency, Euratom, etc., and by a comprehensive chapter on the governmental and industrial organizations concerned with atomic energy in France. The addresses of the principal authorities in other parts of the world are also given, sometimes with more extended information. The remaining sections are shorter and confined to France, but give essentially the same kind of information for the older forms of energy.

Inevitably a book of this kind is out of date before it is published, and it is necessary to note that much of the information in this one applies to 1960 or earlier. However, as a general reference to the supply of energy in France and Europe this volume contains much valuable information.

A.G.H. ●

Last month at CERN (cont.)

A new appearance was given to the restaurant terrace for the CERN annual party on 8 June.

from Geneva and Lausanne, and a group from the firm of Ansaldo San Giorgio, Genoa. Delegations from the Rotary Clubs of Mannheim, Turin, and Bourg-en-Bresse brought the day to an end.

On Friday 22 June, Mr. **Roger W. Tubby,** United States Ambassador to the European Office of the United Nations, paid a visit to CERN, accompanied by Mr. G. Tesoro and Mr. Love, of the U.S. Mission in Geneva. They were welcomed by the Director-general, Prof. V. F. Weisskopf, and conducted round the site by S. A. ff. Dakin (Directorate Member for Administration) and R. Anthoine (Head of Public Information).

The **CERN Annual Party,** held on Friday 8 June, was attended by more than 700 people. Well organized by P. Agostinetti and his helpers, the party was most successful, thanks to the two dance bands, 'Merry Makers' and 'Bruno Grasselli', that played in turns for the whole evening. The 'CERN girls' — young firemen of the Security Service — gave a demonstration of their athletic skill characterized by its energy and speed, while at midnight the main auditorium was filled for a performance by A. Roberts, from Argonne, and his wife Janice, who held the audience spell-bound with their songs of high-energy physics and the trials of academic life. The evening drew to a close with an excellent cold meal served by the restaurant, dancing being interrupted once more for a display of burlesque gymnastics by the Lissajoux brothers, both of them CERN firemen ●

TIME	SYSTEM CHECK	OUTSIDE TEMP °F	RELATIVE HUMIDITY %	BER °F	BER DITY %	#1 °F	#2 °F	#3 X0.1°F	TEMP #4 X0.1°F
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.1445	7500	080	085						7681
X1500	7500	080	086						7693
.1503	7500	081	086						7688
.1515	7500	081	087						7697
.1530	7500	081	088						7693
.1545	7500	082	088						7691
.1600	7500	082	089						7671
.1615	7500	082	089						7683
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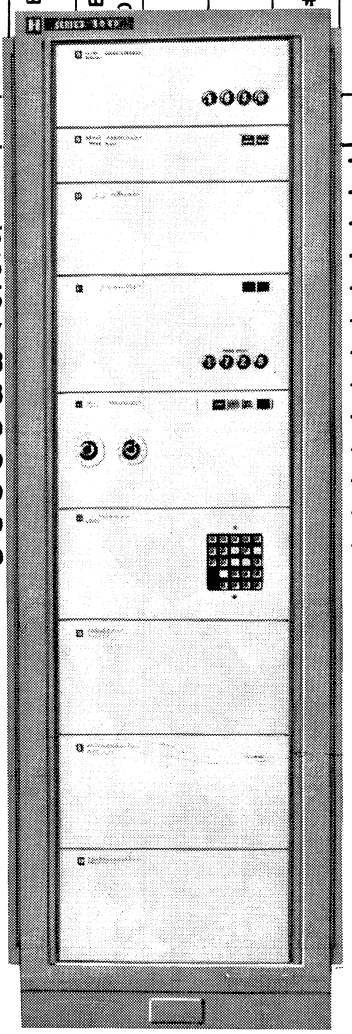

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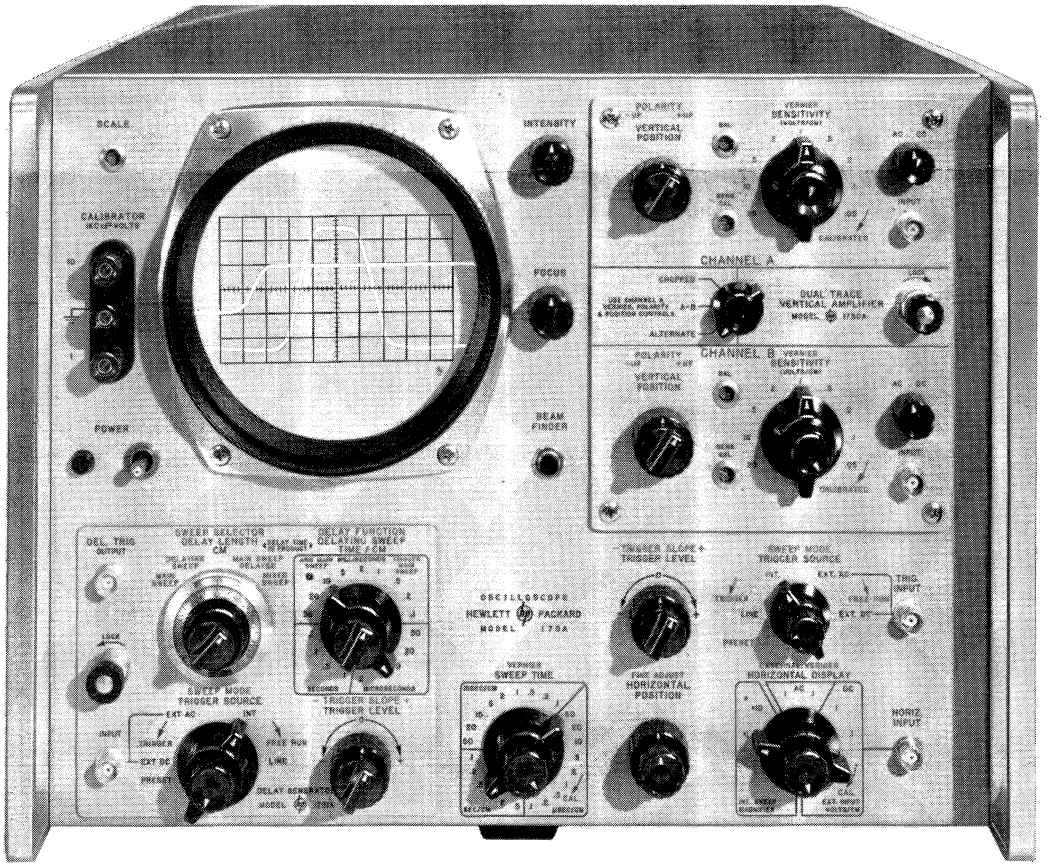

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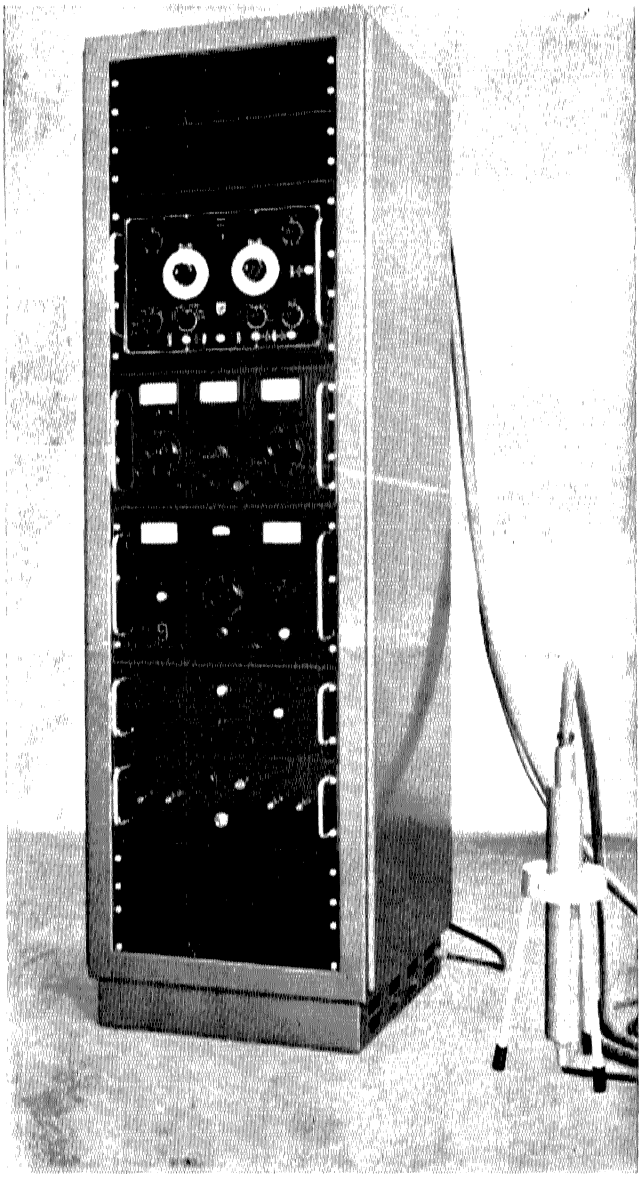

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