

Last month at CERN

New electricity sub-station inaugurated

Just over a month after it had first been put into service, the new 130/18-kV electricity sub-station at CERN was formally opened on Friday 15 October, in the presence of representatives of both CERN and the 'Services Industriels de Genève' (S.I.G.), including its Chairman, Mr. J. Ducret.

The guests were welcomed by Mr. P. Germain, CERN's Directorate Member for Technical Management, who gave a summary of the growth of the Organization's demand for electricity during the past few years and some estimates for the future. Then Mr. J. Rouel, Head of the Site and Buildings Division's planning section and responsible for the CERN side of the project, gave a short history of the creation of the sub-station and the overhead line that brings the current from the power station at Verbois.

Mr. Jaccard, Head of the Electricity Service of the 'Services Industriels', followed with a résumé of the problems that had to be faced both in providing a considerable increase in the power supply to CERN and in integrating this supply into the Swiss and French networks. After the ceremonial bringing on to load of one of the transformers, the guests were taken on a guided tour of the sub-station before gathering in the CERN restaurant for refreshments.

The sub-station itself

Since 1957, CERN's electricity supply has come by means of three 18 000-V underground cables from the 'Renfile' station of the S.I.G., at Vernier, with a capacity of 21 000 kVA. However, the maximum demand has risen from 3500 kW in 1958 through 10 000 kW in 1960 and 15 000 kW in 1962 to 22 000 kW in 1964, and the total consumption in 1964 was over 72 million units (kilowatt-hours)*. In fact CERN at present takes about one tenth of the electricity used in the Canton of Geneva. With the further development of the PS and its facilities, and in particular the proposed construction and operation of intersecting storage rings, the requirements will continue to grow rapidly. Within the next ten years the peak demand is expected to approach 90 000 kW and the annual consumption 300 million kilowatt-hours, which may

* Since the new sub-station was put into service the highest demand registered is 25 800 kW, in October.



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This photograph shows the control desk for the 130-kV side of the new sub-station, with the two transformers and some of the bus-bars and their insulators visible through the windows. This part of the sub-station can be controlled either from this desk or from the main control point of the 'Services Industriels de Genève' in Geneva.

well be as much as a quarter of the total consumption in Geneva.

This situation was attacked some years ago by the joint efforts of the 'Services Industriels' and CERN, and the new overhead line and sub-station is the result. Instead of being supplied from the local 18-kV network of Geneva, CERN is now, in effect, joined directly to the 130-kV circuit that is being established in the Canton.

The 130-kV overhead line linking CERN to Verbois will be continued beyond CERN to Colovrex and then to Romanel (West of Switzerland network). A second line, for 220 kV, on the same towers will serve to supply the Geneva network from the main grid in Switzerland.

The sub-station is in two parts, one belonging to the 'Services Industriels', and the other to CERN. The first comprises an open-air switchyard with a double set of bus-bars at present feeding two transformers, each of 30 000 kVA, which reduce the voltage

from 130 kV to 18 kV. The output from the transformers is fed to the second part of the station, and is then taken by underground cable to the CERN 18-kV distribution centre in the Power House.

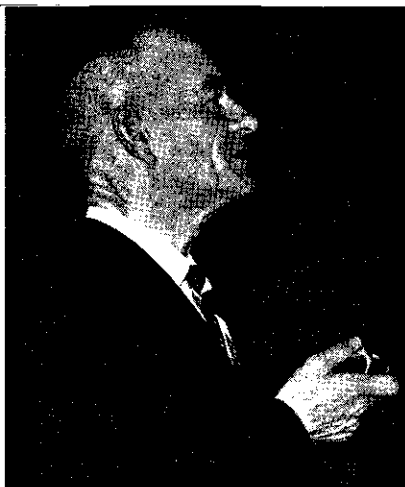
The new sub-station is fully equipped to receive a third transformer when needed, to bring the total capacity up to 90 000 kVA, and six parallel cables, each carrying up to 15 000 kVA, will link the sub-station with the distribution centre. The latter will be fully completed at the beginning of 1968, and the supply system will then be in a position to meet all the foreseeable electricity requirements of CERN, including those of the storage rings.

SC experiments

The 'holiday' months of August and September saw an intensive exploitation of the synchro-cyclotron at CERN. At first sight paradoxical, this is easily explained in two ways: it is often the most convenient time of the year for university groups to get on with their experiments, and the various conferences held at the end of the summer provide an encouragement to push the work forward so as to obtain results for presentation.

One of the experiments concluded during this period was that on the study of the x-rays emitted after muons are

The retiring editor, his successor, and the whole staff of the Public Information Office, send to all readers of CERN COURIER their best wishes for the coming year.



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Professor
L. Leprince-Ringuet

'Science et Vie Sociale' (Science and Society), is the general title of a series of lectures, organized by the University of Geneva and a number of international organizations, including CERN, the fifth of which was presented on 29 October.

The lecturer on this occasion was Prof. L. Leprince-Ringuet, Director of the 'Laboratoire de physique' at the 'Ecole Polytechnique', in Paris, and Chairman of CERN's Scientific Policy Committee. All respect is due to him for the fact that, in spite of a heavy attack of influenza, he was still able to display his gifts as a precise and lively speaker before his audience of several hundred in the main lecture theatre of the University.

His talk, introduced by the Rector, Prof. C. Terrier, took the form of a series of reflections, sometimes amusing, often pertinent, and always clear, on 'Scientific development and general culture'. He classed human activities under two main headings, two poles that ought to be complementary. On one hand the scientific pole, rational and speaking a universal language, hostile to the aggressive use of its attainments. On the other, the meditative pole, realm of philosophy and religion, where differences of mentality have full play.

Study of the scientific pole discloses an evolution: the day of the great individualist is past. With the possible exception of a few isolated theorists, the scale of present-day science is that of the team. Moreover, evolution is seen again, at an increasing pace, in the substance of science itself. In 1953 antiprotons, strangeness, resonances, were unknown, and it is only necessary to look at a ten-years' old popular-science book to see how far the application of scientific discovery has progressed.

The speaker then posed the question whether a specialist can at the same time be cultured, or whether the necessity for precision and team work might not erase personality. Prof. Leprince-Ringuet dismissed the latter possibility. A former free 'King of cosmic rays',

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he knew well the problems of training and running scientific teams. Personalities emerge from research teams, even when individualism becomes submerged by the overriding dictates of machine operating timetables and technical uncertainties.

And culture? Does that emerge diminished or enlarged from the melting-pot of the scientific age? For the speaker, to be cultivated is not to be able to discourse on everything but to be able to show 'a possibility of thought, judgement and pronouncement on oneself, on others and on events'.

It is as well to note, he went on, that few specialists are cultivated: trained for team work, they have lacked contact with the masters of thought who, through the humanities, impress a mobility of spirit and a gift of abstraction. Again, if he had no hope of making cultured men from all the specialists, the lecturer nevertheless foresaw a certain amount of teaching of the humanities in technical institutions. But culture does not come only from formal education; it owes much to the state of mind acquired somewhere between 10 and 20 years of age and resulting from heredity or from environmental influences. Prof. Leprince-Ringuet believes that the adolescent who has been subjected to good influences of this kind will possess a fundamental basic culture that will permit him to specialize without becoming uncultivated.

To conclude, the lecturer examined culture on the scale of the group. Europe benefited from a marvellous cultural inheritance, he remarked, and the uncertainty accompanying its age-long strife has bred a unique artistic potential. Today, on the point of reconciliation, Europe may not only delight in its prodigious fortune but also institute a specific culture of its own, distinct from the American, Soviet or Chinese forms. This can only happen, concluded Prof. Leprince-Ringuet, if Europe's scientific pole is used in support.

The lecturer, warmly applauded, was thanked by Prof. V.F. Weisskopf, CERN's Director General, who at the same time expressed his gratitude to the University, whose active collaboration is of particular value to the international life of Geneva.

Le Cercle de la Presse et des Amitiés étrangères (Press and foreign friendship circle), founded in Geneva in 1920 to provide a link between the local and international communities, dined on 4 November in honour of Prof. V.F. Weisskopf, acknowledging in this way a

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captured into atomic orbits (see *CERN COURIER*, vol. 5, p. 68, May 1965). In order to allow as much uninterrupted time as possible for the delicate measurements involved, one of the normal maintenance periods of the SC was suppressed during August and the accelerator ran more or less non-stop for 34 shifts (over eleven days). The results of this experiment, which are the most comprehensive

yet obtained in this field, are of importance for a more detailed knowledge of nuclear structure. A new team of physicists, from both inside and outside CERN, is now considering the possibility of adapting the same technique of solid-state detectors to the study of pi-mesic x-rays, in order to obtain information on the strong interaction between pions and nuclei.

A combination of groups from the Universities of Lund (Sweden) and

Geneva carried out a series of measurements to calibrate a **polarimeter**, which will be used early next year in a new experiment at the PS on time-reversal invariance in the decay of the lambda particle. The apparatus, consisting of large spark chambers with sheets of carbon as scatterer, enables the polarization of incoming protons to be determined from the relative scattering in different directions. The sparks are viewed by a television camera, which is arranged