

Training and Education

1964-65

During November the Education and Training Section at CERN issued the first details of the new session's lecture courses, under the two general headings of Technical Training and Academic Training. Some of the courses began during the month and others will follow during the winter and spring.

TECHNICAL TRAINING

Taking advantage of the experience gained in the past two years,* a few changes have been made both in the composition of the programme and in the way the technical training courses are organized.

Thus from now on courses will be given at three different levels: elementary, intermediate and advanced, and at each level the courses will be spread over two or three years.

Because of the wide range of abilities and knowledge among those at CERN wishing to follow the courses, it is not always easy to allocate people to a class of the right level, so that for some courses a classifying test has been introduced. In all courses, great importance will be attached to sessions of exercises and practical work and these will also

give the teachers the opportunity to check how well each student is doing.

Carrying over the experimental method to a new field, for the elementary physics instruction, the organizers will be trying out a newly devised course of 'programmed instruction', in English or French, enabling students to work on their own most of the time with periodic meetings for demonstration experiments, showing of films and practical classes.

The courses announced during November are as follows:**

Elementary level

— designed for those who wish to learn, or revise, the basic elements of subjects connected with the work at CERN, particularly in mathematics and physics; a necessary preparation also for the courses at intermediate level.

Mathematics, by F. Louis.

Physics, a 'do-it-yourself' course under the direction of G. Vanderhaeghe, using a specially written, 'programmed' instruction manual in conjunction with the 'Physics' text book of the U.S. Physical Science Study Committee (beginning early next year).

** Apart from the elementary physics, which is also available in English, all courses in this series are given in French.

Intermediate level

— for those wishing to acquire a basic knowledge and practical experience in fields of current use at CERN.

Mathematics ('b' and 'c'), by F. Louis, continuing last years' courses 'a' and 'b'.

Electronics, by F. Ferger, continuing last year's course (beginning in January 1965).

Advanced level

— designed for specialists in the various branches who wish to increase their knowledge or keep up to date with new developments.

Electronics, by G. Amato, continuing previous years' courses (beginning in January 1965).

Mathematics, by F. Louis, continuing last year's course.

Mechanics, by L. Solinas, following the course on 'Strength of materials' given last year (beginning in January).

Vacuum technique, by E. Fischer, following previous years' courses and concentrating on ultra-high vacuum (beginning early in 1965).

Other courses may be organized also this year, if suitable opportunities arise.

* See CERN COURIER, vol. 2, no. 12, p. 10, December 1962; vol 3, p. 154, December 1963.

The eleventh anniversary (cont.)

in September/October by the Secretary General and the Synchro-cyclotron group. Here too, the inevitable barracks were not long in appearing.

On the home front, we had even greater accommodation trials. Admittedly the 'crise du logement' had not then hit Geneva in its full fury, but it was already building up, and we had little experience of flat hunting in those days. I remember my own family having to endure no less than four moves in that first year, and I remember also the arrival of the bailiffs' men from the 'Office des Poursuites' who on a cold winter's day, proposed to remove all the furniture from the apartment we had rented temporarily from an I. L. O. lady on home leave. Our halting French was stretched to its utmost to avoid this tragedy and it was probably only the sight of our squalling 10 month-

old infant that finally softened the invaders' hearts. In fairness to the lady in question, let me add that it turned out to be a misunderstanding all round.

By the end of 1954, the formal European Organization for Nuclear Research had come into being, a Director General (Prof. F. Bloch) had been appointed, the CERN full-time staff had grown to 146 members, the Groups (apart from Theory) were centralized in Geneva, parameters for the proton synchrotron had been settled, working conditions had been sorted out, and a first budget of 25 million Swiss francs was on its way to adoption. The pioneers could look back on a year of solid achievement; they had had their difficulties and their frustrations but I doubt if any of them would not want to do it all over again if they had the chance. Perhaps some of them will! ●

Probable subjects are *elementary electricity*, *elementary and intermediate electronics* and *intermediate vacuum technique*.

ACADEMIC TRAINING

During the academic year 1964-65 the two traditional courses in theoretical and experimental physics will be continued, but in addition there will be lectures on applied physics and some basic courses in physics and mathematics at the academic level. The latter courses are regarded as something of an experiment and their future will thus depend on their success this year.

The courses so far announced are as follows :

Theoretical Physics

Strong interactions at high energies (Part IV), by L. Van Hove (completed).

Weak interactions, by N. Cabibbo and M. Veltman.

Relativistic description of spin, especially helicity formalism, by R. Hagedorn.

Experimental Physics

High-energy neutrino interactions, by C. Franzinetti (from 11 January).

Radiogalaxies and high-energy physics, by G. Cocconi (date to be announced later).

Some methods of spin determination of elementary particles and resonances, by W. Koch (probably in March).

Experimental methods in the physics of unstable particles (continued), by B. Maglic (probably in April).

Applied Physics

Subjects under consideration for this year are :

Beam optics.

Superconductivity.

Basic Courses in Physics and Mathematics

Group theory and the classification of the elementary particles, by L. C. Biedenharn.

Like other seminars and lecture courses organized at CERN, the lectures in the Academic and Technical Training programmes are open to any qualified person from outside as well as to the people working at CERN. Fuller information can be obtained from Dr. G. Vanderhaeghe, Education and Training Section, CERN, 1211 Genève 23, Switzerland ●

Vacation students in 1965

During the summer vacation in 1965, there will again be opportunities for a limited number of European university students to gain practical experience of high-energy physics research at CERN.*

Candidates must be nationals of the CERN Member States and have completed at least two years of university training. The appointments will last from two to four months, during which time the students will assist in the day-to-day work of the groups to which they are assigned. A special series of lectures will be arranged, describing activities at CERN and including courses on theoretical physics and computer programming.

The principal vacancies for summer 1965 are as follows :

Participation in experiments

— In research teams using bubble chambers, spark chambers, electronic counters or nuclear emulsions.

Development and operation of experimental facilities

a) The two particle accelerators (28-GeV proton synchrotron and 600-MeV synchro-cyclotron) :

- linear accelerator, ion source and pre-injector,
- radiofrequency measurements and developments,
- target measurements and developments,
- preparation of information on beams for experimenters.

b) Experimental apparatus

- high-voltage systems,
- particle detection devices,

- particle-beam separators and ejection equipment,
- design and setting-up of beam lines,
- electronic circuits and equipment for counter experiments,
- equipment for the automatic analysis of data from bubble-chamber and spark-chamber experiments.

c) Computer

- programming an electronic digital computer (CDC 6600) for solving scientific and technical problems.

d) Health Physics

- radiation measurements and dosimetry.

Research into the design of future accelerators

- all aspects of the design of high-energy proton synchrotrons ;
- design of a proton linear accelerator ;
- experimental and theoretical studies of storage-ring problems ;
- ultra-high-vacuum techniques.

Students will be paid an allowance to cover their living expenses as well as travelling expenses equivalent to the second-class return railway fare to and from Geneva. Most of them will be accommodated at centres provided for students at Geneva University.

Application forms can be obtained by sending a postcard to the Fellows and Visitors Service, Personnel Division, CERN, 1211 Genève 23, Switzerland. **Completed application forms must be returned to CERN before 1st March 1965** and it will not be possible to consider forms which arrive after that date ●

* See article in CERN COURIER, vol. 4, p. 8, January 1964.