

interpret many of the absorption bands in terms of the phonon energies obtained from the indirect inter-band transitions. In most cases, two phonons are involved, but some of the weaker bands require three.

The optical properties of metals were discussed by F. Abeles, of the Institut d'Optique, Paris. Infra-red reflexion spectra have been studied with the view of obtaining information on the effective number of free electrons. Such observations for some of the noble metals and also for the alkali metals were discussed by M. H. Cohen, Cavendish Laboratory, Cambridge, who distinguished between thermal and optical effective masses and showed how the optical data may be used to determine whether the Fermi surface does or does not meet the boundaries of the first Brillouin zone.

Papers on a number of other materials were also presented, including diamond, quartz, and the compounds, InSb, CdTe and Bi<sub>2</sub>Te<sub>3</sub>. These were mainly concerned with observation of absorption and emission spectra. Such spectra have not yet been obtained with the same high resolution, or analysed in the same detail, as for silicon and germanium.

The conference was chosen as the occasion for the delivery of the forty-second Guthrie Lecture of the

Physical Society, by Prof. W. E. Lamb, of the Clarendon Laboratory, Oxford, on "Experimental Tests of Quantum Electrodynamics".

During the conference an opportunity was available for delegates to visit the new Solid State Physics Laboratory at the Royal Radar Establishment. This was officially opened on the previous day, May 27, by the Right Hon. Aubrey Jones, Minister of Supply, together with a new laboratory for the study of guided missiles. The latter will be part of the laboratory facilities of the Guided Weapons Department under Dr. W. H. Penley. The Solid State Physics Laboratory will be included in the Physics Department under Dr. R. A. Smith. This Laboratory has been specially planned for research in the physics of solids and particular care has been taken to ensure very clean conditions. Complete air conditioning is not used throughout the Laboratory, but only in certain sections which are allocated to work in which minute quantities of certain impurities can have disastrous effects on experimental work. The new building also includes a small radiochemical laboratory and fairly extensive facilities for work at liquid-helium and liquid-hydrogen temperatures. Typical examples of the research work already beginning in the new building were demonstrated to those attending the conference. R. A. SMITH

## THE DIPLOMA IN TECHNOLOGY

**M**ANY who are concerned with the relation of science to industry combine to welcome, as a great educational reform, the institution of courses for the new Diploma in Technology. Candidature is open to science students who have obtained the General Certificate of Education (Advanced Level) or a good Ordinary National Certificate. The courses are mainly held in the top dozen or so colleges of technology, and often on a residential basis. Thus, students from Kent, Cornwall and Cumberland often study together, as at Brunel College, London, and elsewhere.

But obviously, the institution of a number of quite new degree-level courses, in different subjects, takes a good deal of working out, and raises many educational and administrative problems. In order to thrash these out further, the Brunel Staff Association held a national conference on June 20, attended by 180 delegates, being mainly senior members from the colleges concerned. Delegates were welcomed by Dr. J. Topping, principal of the College and himself a member of the National Council for Technological Awards, and by Mr. L. H. Hancock and Mr. E. E. Robinson, the conference chairman and secretary.

The opening paper, by Dr. A. J. Richmond, of the Welsh College of Advanced Technology, Cardiff, outlined the history of this great new educational venture; and the second paper, by Mr. Gordon Smith, of Brunel College, dealt with the industrial training period. While university education is all very well, it often neglects much which the young industrial scientist needs. Consequently, it was decided in 1955 to institute these new four-year courses, and on the sandwich principle. Thus, each student spends alternate periods of six months (*a*) at college and (*b*) undergoing industrial training in approved firms. Many companies now cordially welcome the scheme.

Already a large proportion of the sandwich students are industry-based, that is, paid by their firms throughout the year. But the courses are open equally to students direct from a sixth form, with two advanced level and three ordinary level passes in General Certificate of Education examinations. These receive local education authority awards. More than 700 first-year students enrolled during the present session, and more than 1,000 are expected in 1958-59. The Diploma in Technology has already been recognized as the equivalent of a degree by the Burnham Committee.

Several speakers stressed the overloaded nature of many traditional science courses, where the student is expected to memorize far too many points of detail. A more selective, rather than an encyclopaedic, approach is required. This comment was heard from as far apart as Mr. T. E. Hall, of Liverpool, with regard to building and civil engineering, and from Dr. E. G. Cowley, of Brighton, with regard to chemistry at both college- and school-level. It is one of the great potential virtues of the Diploma in Technology courses that syllabuses can be completely re-designed from first principles, to cope with this among other points. Mr. H. S. Barlow, of South-East Essex Technical College, however, questioned whether all colleges were seizing these exciting new educational opportunities boldly enough.

Modern methods of teaching and examining were also discussed, together with the general liberalization of approach. It was noted that those who qualify after the four years with a Diploma in Technology will be as useful to their firms as the average graduate is after another year or two of industrial training.

Further particulars about the courses are available from the Secretary, National Council for Technological Awards, 9 Cavendish Square, London, W.1.