

TECHNOLOGICAL EDUCATION IN BRITAIN

THE development, up to July 1957, of courses leading to the new Diploma in Technology is recorded in the first report of the National Council for Technological Awards, which was published on November 21*. At that date there were 965 students in thirty-seven courses leading to the new award. The report gives a full list of the courses now in progress which have been approved; these include applied chemistry, applied physics, applicable mathematics, applied pharmacology, applied biochemistry, aeronautical engineering, mechanical engineering, civil engineering, electrical engineering, and production engineering. Of 123 applications which had been received, 83 had been considered by July 31, 1957, and of these 49 were accepted and 34 rejected. The 49 accepted comprised 29 existing courses and 20 proposed new courses.

The report opens with a brief review of the events leading up to the establishment of the National Council, with its two boards of studies, one for engineering and one for technologies other than engineering. The constitution of the subject panels which deal with individual technologies is then mentioned and the procedure for the consideration of courses is described. The written submission from a college is considered by the appropriate subject panel, and, generally, the college is visited by members of the Council, the object of the visit being to inform the Council of the setting in which the course would be conducted, to meet the principal of the college and his staff, to see the equipment and accommodation available, and in general to enable the Council to form a better assessment of the position than could be done on the basis of the written application alone.

Several of the important features of the scheme receive comment in individual paragraphs of the report. Recalling that the standard of admission to courses is either five subjects in the General Certificate of Education, of which two appropriate to the course must be at Advanced Level, or a 'good' Ordinary National Certificate, the comment is made that the Council has not attempted to establish a definition of 'good' for this purpose, but has considered individually the proposals put forward by colleges. It is pointed out that there is also provision for the entry of students not possessing these qualifications but who have completed successfully a course of preliminary training.

Dealing with syllabuses, the report reiterates that, in all courses approved, the study of fundamental science and technology and their application provides a course of disciplined study fully equivalent to that leading to a university honours degree. The interesting comment is made in this section that in relation to some of the courses which the Council has rejected the weakness has been one, not of inadequate syllabus content, but of overcrowding the syllabus, resulting in an excessive number of hours in the week assigned to formal classes.

The importance of providing a reasonable amount of time for private study is emphasized and it is remarked that few colleges have adequate space available for this purpose. This, it is implied, is associated with

inadequate library facilities—a situation which is being rectified.

Specific reference is made to the 'project' as an important part of the work of the course in the final year, and it is suggested that the project may well serve as a link between the industrial training and the subjects studied. Liberal studies which might serve to give the student some appreciation of the social and economic significance of the technology he is studying are expected to form part of the curriculum and should constitute subjects which are examined. It is recognized that the best methods of incorporating such liberal studies are still very much a matter of experiment, and an appreciative reference is made to the serious way in which colleges are tackling the pioneer work to be done in this matter.

In regard to staff, special reference is made to the report of the Special Committee on the Supply and Training of Teachers for Technical Colleges. Of particular urgency are the matters of reducing the excessive teaching load carried by many teachers in technical colleges, the provision of adequate research facilities and of adequate research assistance and clerical assistance. Associated with these are several other recommendations from the report, among which may be mentioned the proposal that "senior members of industrial staffs should be given a special status in colleges permitting them to be closely identified with all the academic activities of the college" and the "appointment of representatives of industry and commerce to college Governing Bodies as a means of ensuring the effectiveness of the college's work and of helping to secure part-time staff from industry".

Another of the fundamental principles upon which the Diploma in Technology is based is restated in the report in the words: "The Council regard a course leading to the Diploma in Technology as a complete entity, the industrial training being just as much a part of the course as the academic study". Full and wholehearted co-operation between college and industrial firm is essential if works experience and academic studies are to be genuinely complementary. The view is expressed that such close and effective association may well be difficult to achieve when a number of small firms are involved, but its attainment is of the utmost importance as it constitutes one of the most valuable—and indeed unique—features of the scheme. Associated with this is the problem of maintaining an appropriate amount of study during the works periods.

The Council is confident that the substantial building programme now in progress will remove the majority of the many deficiencies in accommodation found in colleges. These deficiencies have in the main concerned amenities for student social activities, libraries, accommodation for project work and private study, and for research by staff. Residential accommodation for students is regarded as essential, but the initial absence of such facilities has not prevented the recognition of courses.

The main body of the report concludes with a statement that the Council has set up a special committee to make recommendations as to what post-graduate award the Council should offer. Six appen-

* National Council for Technological Awards. Report for the period December 1955 to July 1957. Pp. 20. (London: National Council for Technological Awards, 1957.)

dixes provide information concerning the governing body, boards of study, courses in progress which have been recognized and new proposed courses, together with notes about the subjects of courses approved and rejected. The last two appendixes state the examination arrangements and give the decisions of the Council concerning the minimum length of a sandwich course, and conditions for exemption from the first year of the course.

It is evident from the report that the response of technical colleges to the institution of the new award has been excellent. The relatively high rate of rejection for courses offered has been due to the insistence of the Council on the maintenance of fully adequate standards, a matter of paramount impor-

tance in the establishment of the standing of the new award.

Enrolment of approximately one thousand students in the courses recognized up to July of last year represents a substantial and encouraging start to a project which should make a great contribution to meeting the need of Britain for additional technologists. Although the appendixes to the report give considerable detailed information about the position, one vital factor is absent, namely, the distribution of students in relation to their method of satisfying the entrance requirements. In assessing the net gain, the real criterion is that of the sources from which the men are drawn, and it is to be hoped that in future reports this information will be presented.

SCIENCE EDUCATION IN MALTA

DURING Malta's tenth education week, which was organized by the Malta Union of Teachers during May 4-11, 1957, Prof. G. P. Xuereb, dean of the faculty of medicine and surgery in the Royal University of Malta, discussed the place of science in the Maltese educational system.

There is in Malta an acute realization of the fact that changes are necessary in the educational system. The social environment has changed, and educational methods have become unrelated to the social background. There must be an intimate and indissoluble connexion between the pattern of an educational system and the social order for which it is preparing the citizens.

One of the principal causes of the maladjustment between Maltese education and the country's needs lies in the fact that the new scientific knowledge, from which social changes have sprung, is incorporated very imperfectly in the educational system.

The majority of Maltese educated men and women are unaware of the way scientific discovery has shaped society in the past and of the way in which it might change it in the future. Inadequacy of science teachers is imperilling the introduction of the sixth forms in school. The Civil servant is having to face the administration of industry, trade development, public health, statistics, technical education, labour and social services created by forces that his education did nothing to lead him to understand. Everywhere there are improvised methods, because education has given no training.

Scientific studies are not providing the social stimulus and the intellectual training which they should. Judged by the actual hours of teaching, science is still a minor subject in general education. Many teachers still believe that science should not be taught as part of a general education—a belief disguised laconically by the statement that they wish to avoid "premature specialization".

The content of the science courses also leaves much to be desired: the course must be coherent so that everybody realizes the connexion between the successive parts of his science work. Instead of coherence there is a strong bias towards physics—and physics in its most arid form. Chemistry is not yet established. Biology, far from being taught as the natural history of animals and plants, is 'nature study' and is hurriedly jostled out of the curriculum when it arouses the inborn curiosity of youth. Science is

being taught as a collection of laws and facts rather than as a constantly growing body of knowledge with social implications of vital importance. The social repercussions of science are relegated to a few isolated industrial applications. Briefly, science is presented as a dead body of facts, rather than as a living cultural and social force.

When these boys go to the Royal University, a course in general science is quickly prescribed for the lawyers, legal procurators and theologians of to-morrow. In this course the lecturers ensure that the students learn to believe the authority of the master or text-book and to reproduce the text when asked. These students are confined to the lecture room and are never referred to the laboratories.

The science courses are not much better themselves. Science students spend two years at the University acquiring the basic theoretical and practical knowledge which they should have more appropriately gathered in the secondary schools. Then, when they are ready to absorb some scientific method, they are passed on to the intermediate course in medicine, pharmacy, architecture and engineering. In medicine considerable time is devoted to introducing them to the sequence of hypothesis followed by experiment or observation and then analysis. Is it surprising that nearly 70 per cent of science students fall by the wayside and that only 30 per cent obtain a medical qualification?

In the past three years the University has taken certain steps to ensure that science is brought into closer relationship with the needs of life. A four-year course for Civil servants has been instituted leading to a diploma in social and political administration. Scholarships in biology, chemistry and physics have been provided, and three Maltese graduates are now at Oxford and London taking the honours school in these specialities before appointment to lectureships in science. The University of Malta will shortly be requiring matriculation in chemistry and in physics or biology from prospective science students. The University has drawn up plans for reform in the course of pharmacy. The libraries have been put on a scientific basis, science laboratories are now completed and funds have been secured for the building of a medical school. These measures are a beginning: they will contribute greatly towards bringing the Maltese educational system into line with a changing social environment.