of new overall mechanisms for apportioning nationally the cost of industrial training and large-scale research projects. This is particularly true if co-operation is to be extended with the medium- and smaller-sized firms, the finances of which will not permit an altruistic attitude towards their profit and loss accounts. The fourth prerequisite is the recruitment of staff, both of the quality and in the quantity required. In order to reach the target of 40,000 students, we may estimate that an additional 3,500 teachers are required. A proportion of these need to be men of very great ability either drawn from industry or sharing their activities between industry and College. Some of these will inevitably be in short supply in the initial period until their work in industry can be supplemented by the new supply of people coming from the Colleges. Nevertheless, the financial factors, particularly salaries and facilities for research, must be faced realistically. The point is that if the top staff of Colleges of Advanced Technology are to be responsible for training future leaders of industry, they must themselves be men of the highest calibre. The fifth condition for sucess has already been dealt with to some extent when we were considering the problems of entrants and selection. It is that of co-operation with the schools. During the past few years this has developed to an unprecedented extent and a good many of the barriers of misunderstanding have begun to be broken down. In one College, for example, the staff make perhaps something like one hundred visits per year to the schools in the region, and several thousands of school boys and girls come in contact with the College. Increasingly, the staff at the schools are visiting the Colleges, taking part in symposia and conferences and special courses, and are beginning to appreciate something of the requirements and objectives. Nevertheless, it remains, from the long term point of view, highly desirable, if an adequate stream of our talented young people are to find their places in the Colleges of Advanced Technology as well as in university departments of applied science and technology, that new methods of teaching science should be experimented with and that a stream of industrially experienced teachers should find their way into the schools.

After a long induction period, higher technological education in Britain, through the medium of the Colleges of Advanced Technology, has taken the initiative in a new experiment, the construction of a fully viable and self-supporting spectrum of study and research, deliberately harnessed to supplying industrial and social needs. The impetus of their designation has carried them forward with a rate of expansion creating many problems demanding complete re-appraisal of our whole philosophy of scientific and technological education. Much of their work carries the inevitable marks of haste and improvisation. It is now essential that the administrative and organizational measures necessary for them to develop autonomously and with full momentum should be put into operation without delay.

[1] Edwards, E. G., *Technology*, **6**, No. 2, 39 (1962).
[2] *Industrial Research in Manufacturing Industry*, 24 (Federation of British Industries, 1961).
[3] Gerstl, J. E., *New Society*, No. 36, 19 (June 6, 1963).
[4] *Rep. Central Adv. Counc. for Education* (England), **2**, 116 (H.M.S.O., 1960).
[5] *Technology and the Sixth Form Boy* (Oxford University Department of Education, 1963). See also, *Nature*, **199**, 958 (1963).
[6] Irving, H., *The Three Cultures* (Leeds Univ. Press, 1963). [See also *Nature*, **199**, 627; 1963.]

OBITUARIES

Prof. J. J. Sudborough

DR. JOHN JOSEPH SUDBOROUGH died at his home in Torquay on July 25 at the age of ninety-three.

Born in Birmingham in 1869, he was educated at the Camp Hill Grammar School and in 1886 entered Mason's College with School and Entrance scholarships. He studied mainly under Profs. Tilden and Lapworth and graduated B.Sc.(London) in 1889 with double first-class honours in chemistry and geology.

Two years research work under Prof. Tilden followed, the subject being the additive reactions of nitrosyl chloride with olefines. In 1891 he obtained one of the first scholarships offered by the Commissioners of the 1851 Exhibition and proceeded to the University of Heidelberg, where he worked under Prof. Victor Meyer on stilbene derivatives. He graduated Ph.D. in 1893 and continued for a further year as private assistant to Victor Meyer, working on the subject of 'steric hindrance' as shown by diortho-substituted benzoic acids.

Returning to Britain, he worked for a period at Owens College, Manchester, and obtained a D.Sc.(London) degree. He was then appointed lecturer in organic chemistry at University College, Nottingham, under Profs. Clowes and Kipping, and there continued research, with student assistance, on 'steric hindrance' and on the additive compounds of trinitro-derivatives of benzene.

In 1901 he succeeded Dr. Lloyd Snape as professor of chemistry at University College of Wales, Aberystwyth. It was a time of great activity in Wales, for the University had been established in 1896 and the new intermediate schools were sending their matriculated pupils to the Colleges. Sudborough quickly realized his opportunity, organized an honours degree course and a research school and secured increased accommodation for his rapidly expanding department. A few years later, the generosity of Mr. David Davies (afterwards Lord Davies) and his Llandinam family enabled the College, in 1907, to erect the Edward Davies Memorial Laboratories, the equipment of which the professor supervised with meticulous care and of which he became the first director. During his decade of service at Aberystwyth, Sudborough taught and trained in research many men who later occupied important positions in the scientific world. He also took a leading part in College administration, served as dean of the Faculty of Science and as an officer in the Officers' Training Corps Contingent.

In 1911, after the death of his wife, he accepted the appointment as professor of organic chemistry at the Indian Institute of Science, Bangalore. Here, in association with the director, Dr. M. W. Travers, he inaugurated the work of the Chemistry Departments and developed a sound and thorough system of training in organic chemistry. In 1914 Dr. Travers retired, and Sudborough became head of the Departments of General and Organic Chemistry with Dr. H. E. Watson as assistant professor. Their output of papers, many of technical importance, was afterwards considerable.

After retirement in 1926 he lived at Ermington, South Devon, where he took much interest in local affairs and served on the Plympton Rural District Council. Later, moving to Torquay, he became honorary secretary for many years of the Torquay Natural History Society. He became a life governor of the University College of Wales and served for many years on its Council.

He was twice married, first to Miss J. Hunter, of Belfast, and secondly to Miss Elsie Bean, daughter of Mr. A. Bean, sometime postmaster-general of the Punjab, who survives him. He leaves no children.

T. CAMPBELL JAMES

Dr. B. Lambert, O.B.E.

DR. BERTRAM LAMBERT died on July 1, aged eighty-one. For half a century, as undergraduate, demonstrator,