standard instrumental conditions associated with all scales, including those of altitude.

The need for relating barometric measurements to a definite gravity value has long been recognized. In the past, various values have been used. The recent general acceptance of the conventional value for standard gravity, 980·665 cm./s.$^2$ (which is not now associated with lat. 45° and is therefore not liable to revision), and its adoption as the reference value for all barometric purposes, constitute notable steps forward. The similar use of a conventional value for the density of mercury at 0° C. is also a noteworthy advance, as it gives precision and permanence to the millimetre and inch pressure units, while not precluding allowance being made, in barometric measurements of extreme accuracy, for the actual density of the mercury at 0° C.

In the past, it has not been clear whether millimetre and inch scales on mercury barometers should be regarded as scales of pressure (as they are on aneroid barometers) or as scales of length set up to measure the length of the mercury column. The millibar scale has always been free from such doubt, the millibar being clearly a unit of pressure and not of length. It has now been decided to regard all three scales as pressure scales, giving readings in the standard pressure units when the barometer is under standard instrumental conditions.

### Effect of the Changes

The adoption of the new conventions will greatly simplify the manufacture and standardization of mercury barometers, the correction of their readings to standard conditions, the final expression of pressures, and the conversion of either readings or pressures from one scale unit to another.

As aneroid barometers are also to be regarded as graduated in terms of the new pressure units, their readings will show the same inter-relationships as the scale readings on mercury barometers.

At a pressure of about 1,000 mb. the reading of a Fortin millibar barometer graduated on the new basis will be 2·0 mb. *greater* than one graduated on the old basis. This is almost entirely due to the change in the standard temperature of the mercury from 12° to 0° C., and the difference is proportional to pressure. Millimetre Fortin and Kew barometers will remain unaltered, because their scales have always been standardized at 0° C. At ordinary atmospheric pressures the reading of an inch Fortin barometer will be 0·01 *less* than before. This is due to the change in the length of the inch scale between 62° F. and 0° C. The difference is proportional to pressure. On account of the special temperature coefficients of Kew-type barometers, millibar and inch Kew barometers will not be affected in quite the same way as the corresponding Fortin barometers. Details will be found in B.S. 2520.

### Implementation of the Changes

It is recommended that existing millibar and inch mercury barometers should be modified to comply with the new conventions as soon as is practicable, for example, when barometers are due for repair. As from January 1, 1955, the testing of barometers by the National Physical Laboratory will be based exclusively on the new conventions; new barometers will be required to satisfy the Laboratory tolerances. For the time being, barometers already in service will be admitted unaltered to the test provided that certain inscriptions required by the British Standard have been marked permanently upon them. To prevent misconception, a small label referring to the National Physical Laboratory test will be attached to any unaltered barometer which shows large index corrections as a result of the change in the basis of the pressure scale.

Save in exceptional circumstances, no accurate pressure measurements can be obtained with a mercury barometer unless due correction is made on account of temperature and gravity. The British tables hitherto used for this purpose have been derived for the most part from the International Meteorological Tables published in 1890 and not since revised. In relation to modern instruments and pressure units they have for many years been incomplete and, to some extent, inaccurate. The British Standard therefore incorporates comprehensive correction tables, applicable to all current types of mercury barometer, on the basis of the new units and conventions.

The advantages of the new system are permanent, and will far outweigh the inconveniences in first applying them. The conventions will be implemented in important government services and by the barometer manufacturers. It is hoped that scientific workers and others will henceforth express barometric pressures exclusively in terms of the international units and symbols, and, with the view of reducing to a minimum the period of change-over, that they will have their millibar and inch barometers brought into accord with the new conventions at the first opportunity.

I wish to acknowledge the responsibility of Mr. F. A. Gould, who was until lately in charge of the barometric work at the National Physical Laboratory, for the Laboratory's part in the development of the new conventions. This work was carried out as part of the research programme of the Laboratory, and the present paper is published by permission of the Director of the Laboratory.

## OBITUARIES

### Prof. R. E. D. Baker

RICHARD ERIC DEFOE BAKER, professor of botany in the Imperial College of Tropical Agriculture, died in Trinidad on November 19, of heart failure after a short illness, in his forty-sixth year. His death is a great loss to botanical science in the tropics, and especially to the College which he served untiringly for more than twenty years.

Born in 1908, Baker was educated at Oundle and Trinity Hall, Cambridge, where he obtained a first class in Part II of the Natural Sciences Tripos; he also rowed for his College. After a year of postgraduate study at the Imperial College of Tropical Agriculture, of which he was awarded the associateship, in 1933 he was appointed lecturer in mycology in the College, and promoted to professor in 1945. Although his earlier interests were mainly in cryptogamic botany, in which he did outstanding work on witches' broom disease of cacao (*Marasmius perniciosus* Stahel), he was no narrow specialist, and in 1949 was appointed to the chair of the newly amalgamated Departments of Botany and Mycology. He was an enthusiastic student of the phanerogamic flora of Trinidad and since 1947 had been editor of the "Flora of Trinidad

and Tobago", of which most of the parts dealing with the Dicotyledons have already been published or are in the press. He was in charge of the botanical sections of the banana and cocoa research schemes at the College, and in 1948 he went on an expedition to East Africa to collect wild and cultivated species of bananas for extension of the breeding stocks. In 1952 he led an expedition to Colombia for the purpose of collecting wild species of *Theobroma*. He was also largely responsible for the successful organization of River Estate, the College's field station for cacao research.

Baker (or 'Dick', as he was known to staff and students alike) had a charming personality, a great sense of humour, and an interest in many subjects apart from his profession. Although, perhaps, he sometimes found it difficult to suffer fools gladly, he freely offered his time and experience to those whom he did not consider to be fools, and in this his judgment was seldom, if ever, at fault. The news of his untimely death will be a great shock to the numerous past students of the Imperial College of Tropical Agriculture, now scattered over all parts of the British Commonwealth, who have been taught and inspired by him.

If he was not, in the ordinary sense, a religious man, he whole-heartedly put into practice that great precept, "Whatsoever thy hand findest to do, do it with all thy might". He has been buried in the College cemetery, next to the grave of his former professor, H. R. Briton-Jones, who died in 1936. He is survived by a widow and four daughters.

T. W. KIRKPATRICK

## Mr. H. G. Yates

BY the very sudden and untimely death on September 15 of Mr. Henry George Yates, the marine turbine industry has suffered a serious loss. At the age of forty-six he had not reached the peak of his activities, and his abilities as a steam turbine designer in the marine industry were widely recognized and appreciated. He was widely read, interested in amateur dramatics, and had a happy family life, although his two children are only at the start of their scholastic careers.

The study of vibration was a great hobby of his. Anything from the vibration of a sewing machine at home to the most complex types of vibration occurring in geared turbine systems was strenuously investigated. He had outstanding patience in explaining the more abstruse points in designs. His eyesight had been defective from birth in one eye, but he developed amazing ability in dealing with complex mathematical formulæ in his head.

After a distinguished scholastic career, he graduated at Trinity College, Dublin, in 1930 with first-class moderatorships in mathematics and physics and was afterwards awarded the M.A. degree. He continued at the University as a lecturer in physics for two years before deciding that he would prefer to be an engineer. He served a student apprenticeship with the English Electric Co., Ltd., at its Willans Works, Rugby, and was employed after his apprenticeship in the Turbine Department of the Company. In 1940 a Research Department was set up, and Yates was put in charge of the work. He joined the Parsons and Marine Engineering Turbine Research and Development Association (Pametrada) very near the beginning, and was associated with the growth of the Association, particularly in the work of the Design Department, in which many designs were prepared for turbine machinery to be installed in important British and foreign ships, the total horse-power of the designs aggregating some seven million. During this time Pametrada acquired a number of foreign licences, which enabled Yates's work to influence building in countries such as Holland and Canada.

Yates was an associate member of the Institution of Mechanical Engineers, Fellow of the Institute of Physics, a member of the American Society of Mechanical Engineers, and at the time of his death was a member of council of the North-East Coast Institution of Engineers and Shipbuilders and chairman of the North-East Branch of the Institute of Physics. Apart from the technical committees of Pametrada on which he was a valued member, he was on the Admiralty Noise Reduction Panel NRP.2, AVGRA Sub-Committee *D*, the Admiralty Gearing Noise Advisory Panel, the Heat Transfer and Heat Exchange Committee of the Mechanical Engineering Research Organization and Committee *J* (Power Plant) of the British Electrical and Allied Industries Research Association.

The thing that struck most people meeting him for the first time was his great personal charm and very quiet way in explaining difficult points in design so that they became clear and easy to understand. He is greatly mourned by his colleagues at Pametrada, where he spent the last ten years of his life in charge of the Design Department.

THOMAS W. F. BROWN

## Mr. E. Laurmann

THE sudden death of Emil Laurmann on November 10 at the age of sixty-four came as a great shock to his friends and colleagues in the Royal Society Mond Laboratory, Cambridge. An Estonian by birth, he was trained as an engineer at Strelitz in Germany but was unable to complete the course owing to the outbreak of war in 1914; he worked for a time at Siemens in Leningrad, and then at the newly organized Polytechnic Institute, where he started his collaboration with Kapitza. In 1922 he followed Kapitza to Cambridge and for many years acted as his personal assistant, first in the magnetic department of the Cavendish Laboratory and later in the Mond Laboratory. His qualities of inventiveness, skill and patience in all sorts of techniques such as electrical engineering, fine mechanics, photography and the handling of delicate metal crystals, contributed largely to the successful outcome of Kapitza's investigations at very high magnetic fields. After Kapitza's return to the Soviet Union, Laurmann spent a year in Moscow helping to set up similar equipment at the Institute for Physical Problems and collaborated with Kapitza in studies of the Zeeman effect at very high fields.

During the years since the Second World War, Laurmann worked with me in various researches on superconductivity and the magnetic behaviour of metals at low temperatures, and I owe more than I can adequately express in words not only to his technical skill and ingenuity but also to his patience and good nature. Many others in the Mond Laboratory have also benefited from his advice and help, which he always gave willingly in a characteristically quiet and unassuming way; his presence in the Laboratory will be sadly missed. He is survived by his widow, a daughter and a son.

D. SHOENBERG