

## MATHS FOR ENGINEERS

### Special Functions for Scientists and Engineers

By W. W. Bell. Pp. xiv + 247. (Van Nostrand: Princeton, N.J., November 1968.) 30s paper; 65s boards.

THE description of natural phenomena often involves the use of sophisticated mathematics, but—in this country at any rate—the mathematical training imparted to physicists and engineers does not err on the side of robustness. A writer of a mathematical textbook designed for such readers thus finds himself in a dilemma: should he observe all the niceties of strict mathematical reasoning and risk blank incomprehension or, alternatively, should he shun the rigours of “real” mathematics and exhibit a largely formal development of the subject? The author of the book reviewed here has chosen the latter course and, in the present climate of the educational environment, it is difficult to cavil at his decision.

His object is to acquaint the reader with the principal properties of special functions (in particular those associated with the names of Legendre, Bessel, Hermite, Laguerre and Chebyshev) which constitute the small change of mathematical physics. He writes for readers whose knowledge of mathematics barely extends beyond the calculus and a nodding acquaintance with series, and consequently he has to skate lightly over questions involving the justification of infinite processes. As may be expected, the stress is predominantly on the formal side of the subject: the main concern is with identities and differential equations satisfied by special functions, with their orthogonality properties, and with generating functions. The text is confined to the mathematical theory; the author avoids, as a matter of policy, the treatment of physical applications. The arguments are deployed in considerable detail, and the presentation is easy to follow.

On its own ground, this is a nice, unpretentious and useful book. It is not outstanding, but it will give very considerable help to students and practitioners of physical science for whom mathematics is a daily, if not always a highly regarded, tool.

L. MIRSKY

## GERMAN UNIVERSITIES

### Guide to German Universities

Compiled by Karl-Otto Saur. Part 1: Universities. Pp. xxx + 666. Part 2: Technische Hochschule. Pp. xxxiv + 667–1296. (Verlag Dokumentation: München-Pullach. Distributed in the UK by CBD Research, Beckenham, Kent, 1967/1968.) 250s.

THESE two volumes provide a compact and informative guide to German universities; their main value is likely to be the very comprehensive list of German professors which is included. General information about the universities is scantier—the guide makes no attempt to give details of courses, constitutions or administrative frameworks—but it is encouraging to find that the West German publisher has been open-minded enough to include information about the German Democratic Republic as well as the Federal Republic.

The guide comes in two volumes, bound in stout plastic. Volume one covers the universities of West and East Germany, with a list of all the universities in the world thrown in for good measure. Volume two does the same for the Technische Hochschule, and includes the complete index for both volumes. The index covers faculties, towns, and individuals, as well as a special index of institutes and professors. No academic staff apart from professors are mentioned. A final index, in English, is a list of disciplines, which enables the reader to locate all the departments in Germany interested in, say, Arabian philology.

Unfortunately, the layout of the volumes tends to confuse rather than illuminate. It compares poorly, for example, with the *Commonwealth Universities Yearbook*, another handbook which performs a similar function for universities in the British Commonwealth. Diligent index-searching does enable this drawback to be overcome. It would also have been an enormous advantage to have some idea of the special interests of the professors listed, but this would doubtless have meant a much more bulky volume. It is hard to test the publisher's claim that the volume is up to date, but the intention is to issue a new edition in 1968. The same publisher is also intending to produce similar guides for the Austrian and Swiss universities.

NIGEL HAWKES

## Obituaries

### Professor W. M. Court Brown

PROFESSOR W. M. COURT BROWN died on December 16, 1968, at the age of 50. He was director of the Medical Research Council Clinical and Population Cytogenetics Research Unit at the Western General Hospital, Edinburgh.

His early training was in radiotherapy and his first researches were concerned with elucidating the nature of radiation sickness. He then moved on from studying the more acute effects of radiotherapy to some of its possible long term consequences. He was the first to establish that radiotherapy as used for conditions such as ankylosing spondylitis could lead to the development of leukaemia. Subsequently with W. R. S. Doll, it was shown that the incidence of leukaemia was roughly proportional to the amount of radiation received by the bone marrow. They deduced a quantitative relationship between the dose of radiation and the risk of developing leukaemia that has been used internationally as a basis for deciding permissible levels of industrial and medical exposure.

Much of this work was done at the Postgraduate Medical School, London, where Court Brown was a member of the Medical Research Council staff. In 1956 he moved to Edinburgh and was appointed director of a newly formed Medical Research Council unit.

The late fifties saw the first reports of the new techniques which made the direct investigation of human chromosomes a practical possibility, and laid the foundations for the quite explosive developments in human cytogenetics which subsequently occurred. Court Brown immediately saw the possibilities opened up by these technical advances and he set about building up in his unit a research group to take advantage of them, not only in connexion with the investigations into the effects of radiation, but more widely. His unit has since established itself among the leading international research teams in human cytogenetics, and has made many important contributions. These include, among others, the first descriptions of the XXY and XXX abnormalities in 1959; the demonstration in 1961 of the high incidence of sex chromosome abnormalities among women with primary amenorrhoea; the demonstration in 1962 that radiation-induced chromosomal aberrations in circulating lymphocytes could be detected ten years or more after a single course of X-ray treatment; the finding in 1963 of consistent increases in the number of aneuploid cells in the older age groups, which differ in character in men and women; the discovery in 1965 of the quite unusual incidence of XYY males in maximum security institutions for people of particularly violent disposition; and the first systematic studies of the incidence of chromosomal aberrations