BOOK REVIEWS

BUDDEN, F. J. AND WORMELL, C. P., *Mathematics through Geometry* (Pergamon Press, 1964), ix+230 pp., 25s.

A defence of the traditional role of Pure Geometry to " S " level standard, with specific proposals for improvement. Viewpoints provoking agreement or violent disagreement occur on nearly every page. The overall effect is stimulating. Have, in fact, the long-term results of discarding so much previously deemed of worth been sufficiently assessed? Certainly no one who has to make the choice between what to omit and what to retain, should fail to read this book. Those who continue to teach traditional topics should make sure of a copy. S. READ

MEYER, HERMAN, *Precalculus Mathematics* (The University Series in Undergraduate Mathematics, Van Nostrand), xi+365 pp., 58s. 6d.

A competent, modern, axiomatic review of the basic portions of school algebra, trigonometry and coordinate geometry, with intuitive amplification where relevant. Pure geometry, probability and detailed solution of triangles are omitted in favour of 2- and 3-dimensional vectors. Set notation is used throughout. Complex numbers are introduced as ordered pairs and the treatment includes de Moivre. There is consistent emphasis upon logical development, with consequent curtailment of manipulation. Altogether a scholarly book. S. READ

SACHS, J. M., RASMUSSEN, R. B. AND PURCELL, W. G., *Basic College Mathematics*, 2nd Edition (Allyn and Bacon), ix+331 pp., \$7.50.

Attempts an axiomatic review of school mathematics. Set notation is explained, but not much used. Standard techniques of arithmetic and algebra to " O " level are developed conventionally, while trigonometry and formal coordinate geometry are omitted. Euclidean pure geometry is briefly discussed and there is an introductory chapter on statistics, followed by another on " assorted topics ". The book attempts too much and leaves an impression of diffuseness without underlying unity.

S. READ

BARI, NINA K., *A Treatise on Trigonometric Series* (Pergamon Press, 1964), Volume I, xxiii+553 pp., 84s.; Volume II, xix+508 pp., 105s.

After some introductory material, the first volume of Professor Bari's treatise begins with a chapter of 166 pages devoted to basic theorems on trigonometric series. This chapter contains rather less material than does the Cambridge Tract by Hardy and Rogosinski, and it demands appreciably less of the reader. It is followed by chapters on Fourier coefficients, convergence at a point, Fourier series of continuous functions, convergence and divergence in a set less than the whole interval (e.g. almost everywhere), and " adjustment " of functions. The chapters in the second volume are on summability, conjugate series, absolute convergence, series with decreasing coefficients, lacunary series, general trigonometric series, absolute convergence of general trigonometric series, uniqueness of a trigonometric series expansion, and the representation of a function by trigonometric series. To the original edition, published in Russian in 1961, Professor P. L. Ul'yanov has added problems at the end of each chapter of Volume I; the more difficult of these are accompanied by a hint or reference, or occasionally by a warning that the problem is as yet unsolved.

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Inevitably this treatise has been compared with the 1959 two-volume edition of the one by Zygmund on the same subject. Zygmund's volumes are rather shorter, but they cover appreciably more ground. Professor Bari has concentrated on the classical problems and direct modern developments. She has made little use of complex variable theory or functional analysis, and has excluded trigonometric interpolation of linear operations as well as Fourier integrals and multiple Fourier series. On the other hand the work of Russian authors is liberally represented in her treatise, and this alone makes an English translation worth while. In particular, the last chapter of Volume I is devoted to Men'shov's theorem (merely stated in the notes to Zygmund's Chapter VII), that by modifying in a set of arbitrarily small measure any function which is measurable and finite almost everywhere in $(0, 2\pi)$ one can produce a function whose Fourier series converges uniformly, and related results, while the last chapter of Volume II is devoted to the work of Men'shov, the author and other Russian writers on such problems as the existence of a trigonometric series convergent almost everywhere to a given function which is periodic, measurable and finite almost everywhere, and the existence of universal trigonometric series.

The pace throughout is leisurely, more so than in any book of comparable standard known to me, and there is a general air of spaciousness. The bibliography and a complete list of contents are printed in both volumes. In addition, Volume I has its own index and Volume II a comprehensive index. There are no systematic notes such as Zygmund gives by way of an appendix, but the helpful introductory remarks at the beginning of each chapter compensate partly for this omission. As she points out in her preface, Professor Bari has deliberately written for undergraduates and research students, and one feels that her original Russian monograph was a fine and scholarly text.

Unfortunately some of Professor Bari's work has been undone in the translation. The English is often quaint, the punctuation rarely helps one to appreciate the sense, and the text is often inaccurate. The reader will wince when he encounters phrases such as " the inequality holds $| S(x) | \leqq Mu_0$" (p. 2), " Let us prove what takes place " (p. 13), or " consequently f^2 is moreover summable " (p. 84), and he will smile when he reads that " the hypothesis just proved is even more true " (p. 5), or that " $\phi_x(u)$ will be still more continuous " (p. 113). On other occasions he will have to make more effort to see what the author meant, for example in the mistranslated proof of Theorem 2 on p. 6, and in the misleading statement of the case when $f(x, y) \geqq 0$ of Fubini's theorem.

The translator seems to be unable to distinguish between " can ", " may " and " should ", and she does not appreciate the technical meaning of certain phrases. No mathematician would speak of " dividing an integral by two " (p. 107) when he meant splitting it into two parts.

The quotations above are all taken from Volume I, but we need venture no further than the first page of Volume II to find mistranslation (" if the series diverges or converges to $f(x)$, then $S_m(x)-f(x) \neq o(1)$ "). On the second page we realise that the students for whom Professor Bari wrote so painstakingly will need to be alert enough to insert modulus signs if they are to make sense of the central paragraph.

A complete list of misprints would take up an enormous amount of space; they occurred so frequently in the first chapter of each volume that I found myself singing Leporello's catalogue aria. Strangely enough I did not find nearly so many misprints or errors in the later chapters, and I do not think that this was entirely because they were more difficult to detect there. The type is of pleasing appearance, and the layout is very good except for occasional lapses which should have been corrected at the proof stage.

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