Vector algebra and differentiation are dealt with in the first three, vector calculus in the fourth, and operator techniques and Orthogonal Curvilinear Coordinates in the fifth, each chapter being well supplied with worked examples and problem exercises. Related topics from applied science are interspersed with vector ideas.

The sixth chapter begins with a discussion of the "nature of science" and uses vectors to systematically develop the theory of the dynamics of a rigid body.

R. J. Tait, University of Alberta

Elementary Real Analysis, by H. G. Eggleston. Cambridge University Press, Cambridge, 1962. viii + 282 pages.

This text is intended to cover all of the theoretical aspects of real variable analysis needed in the first two years of honours mathematics courses at British universities. In fact, as seen from the outline below, certain portions of complex analysis are also covered. The flavour and spirit of the text can be accurately inferred from the following quotations from the author's Preface:

"It was my intention to write a book in which no assumptions were made except those stated as such, in which definitions were made as explicit as possible, in which there were no forward references to results to be proved later and in which the development of the subject was logically self-contained. With these restrictions I found it advisable to defer the introduction of the elementary functions, cos, sin, exp, log until a comparatively late stage, with the result that no exercises involving these functions could be included until after Chapter 19.

Only those parts of analysis that any analyst will be certain to need have been included. Anything in the nature of 'applied analysis', such as differential equations, Fourier series, etc., has been omitted."

In addition, the text contains no problems (or examples) of an applied nature, and none on the techniques of calculus. Thus, terms such as velocity, acceleration, mass, force - even length, area and volume - do not appear at all. The text consists of 28 chapters, each containing a few worked examples and followed by from 7 to 20 exercises, mostly of a "theoretical" character. There is a 20 page Appendix on the number system (beginning with Peano's axioms, and on to the reals by Dedekind cuts), plus a valuable 55 page section entitled "Hints on the solution of exercises and answers to exercises". A simple computation reveals that the 28 chapters average about 7 pages per chapter.

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After a brief preliminary section on sets, functions and numbers, the first six chapters (to p. 39) deal with real and complex sequences. In these chapters the O, o, and $\sim$ notations are introduced, as well as a short section on enumerability. Chapters 7 through 11 deal thoroughly with series, including double series and power series. Many of the standard theorems for (real or complex) power series are deduced neatly from results for double series. Chapter 12 deals briefly with point set topology of the real line and the complex plane. These results are applied in Chapter 13 to the proof of the Bolzano-Weierstrass, Heine-Borel, and Cantor theorems. Limits and continuity of (real or complex) functions of one real variable are adequately dealt with in Chapters 14 and 15, while monotonic functions and functions of bounded variation are handled in Chapter 16. To illustrate the depth of treatment, and as a typical example of the type of problem contained in the exercises, the student is asked to prove that if f is Darboux continuous and of bounded variation on $[0, 1]$, then f is continuous on $[0, 1]$.

Derivatives (as well as the four Dini derivates) appear for the first time in Chapter 17. This chapter contains a very short proof of Descartes' rule of signs, as well as the usual mean value theorems, l'Hospital's rule, etc. Taylor's formula (with Schlömilch's remainder) and some of its applications appear in Chapter 18, while convex and concave functions (including Jensen's inequality) are considered in Chapter 19.

The elementary transcendental functions exp, sin, cos are defined for real or complex values by their Maclaurin series, and their properties derived, in Chapter 20. The logarithmic function is defined (only for real positive arguments) as the inverse of the exponential function, while the inverse trigonometric functions are not considered at all. Chapter 21 deals with the following classical inequalities: Arithmetic-Geometric mean; Hölder's; Cauchy's; Minkowski's. The first two are deduced from Jensen's inequality, and the last two from Hölder's.

The Riemann integral is treated by classical methods in Chapter 22, with the fundamental theorem of calculus, integration by parts, change of variable, and mean value theorems left to Chapter 23. (These two chapters are somewhat longer than average, totalling 22 pages.) Riemann-Stieltjes integrals and improper integrals are dealt with in Chapters 24 and 25. Further tests for the convergence of real series, including the integral test and Gauss' test, are given in Chapter 26, while uniform convergence of sequences, series and integrals are disposed of in Chapter 27.

The final chapter deals with continuity and differentiability for functions of two real variables. This chapter (14 pages long) contains short, correct proofs of both an implicit function theorem and Taylor's formula, as well as results on the inversion of the order of differentiation and integration.

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This text appears to be almost free of typographical errors! The reviewer detected only one, at the bottom of p. 81 where $\cap$ should be $\subset$. Aside from the extreme brevity with which most topics are treated, this reviewer can object to only a few rather trivial points: the author's original definition of function on p. 1 (allowing multiple-valued functions); a tendency to omit standard names of some important results such as Cauchy's convergence criterion, l'Hospital's rule, Mertens' theorem, and the fundamental theorem of calculus.

Perhaps the best known work (in English) with which this text can be compared is Hardy's Course of Pure Mathematics. Eggleston covers almost the same material as Hardy, in a decidedly purer and more modern way, the main omission being material on functions of a complex variable corresponding to Hardy's Chapter X. In the reviewer's opinion, the charm of Pure Mathematics is also missing from Elementary Real Analysis. On this continent, the text would be most useful as a supplementary or reference text for the better student taking Advanced Calculus in the third year of an honours mathematics course.

Paul R. Beesack, Carleton University

A First Course in Analysis, by J.C. Burkill. Cambridge University Press, 1962. 186 pages. $3.85 (U.S.).

The chapter headings together with the number of pages in each are: Numbers (23), Sequences (24), Continuous Functions (18), Differential Calculus (23), Infinite Series (16), Special Functions of Analysis (15), Integral Calculus (32), Functions of Several Variables (19), Notes and Exercises (14).

This is an excellent book and the description on the dust-cover is accurate. "This straightforward course based on the idea of a limit is intended for students who have acquired a working knowledge of the calculus and are ready for a more systematic treatment which also brings in other limiting processes, such as the summation of infinite series and the expansion of trigonometric functions as power series. Particular attention is given to clarity of exposition and the logical development of the subject matter. A large number of examples is included, with hints for the solution of many of them." If I were teaching a course for honours students of the type described, this book would rank high as a possible choice of text. The size and price are modest, just what is wanted in a text, and the printing and design are of the high standard of the Cambridge University Press.

P.S. Bullen, University of British Columbia

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