may, of course, approximate functions with singularities or alternatively an infinite range. Economization of continued fractions is considered and Padé approximations are linked with the quotient-difference and ε-algorithms which have applications elsewhere. Existence and characterization theorems for rational approximations are merely quoted, but the corresponding use of the exchange algorithm is described in considerable detail from the practical standpoint.

The last section is concerned with non-linear minimax approximations, the approximation of linear functionals (in particular, the construction of quadrature formulae) and functions of many variables. Two chapters are devoted to spline functions which may more easily approximate non-analytic functions than polynomials or rational functions. A chapter with the intriguing title "An Introduction to ε-Entropy" introduces a measure of the minimum number of binary digits needed to furnish an approximation to an accuracy ε, and finally some practical advice is offered on the choice of approximating functions and method.

The book is well produced, although I noticed a few minor errors such as the occasional omission of modulus signs. There is an extensive and excellent list of references to books and articles. K. E. PITMAN

VISIBLE WATER

Open Channel Flow

By F. M. Henderson. (Macmillan Series in Civil Engineering.) Pp. xxii+522. (New York: The Macmillan Company; London: Collier-Macmillan, Ltd., 1966.) 115*s*.

THE flood of works on fluid mechanics continues unabated. This book, however, is to some extent unusual in that attention is concentrated on water that one can see, as distinct from water concealed in pipes, turbines and pumps. The field covered is exceptionally wide, for together with the common basic topics there are long chapters on flood routing and sediment transport. Yet we are told that the book is designed for a one year college course. Professor Henderson must indeed be blessed with a class of remarkably zealous and talented students. The wide range of the book exacts its price, and some important matters are mentioned only in a misleading and slipshod manner. Thus Fig. 1–9*a* which indicates boundary-layer formation on an infinite flat plate is followed by a collection of formulae for such quantities as thickness and shear stress with no indication how these were derived, and the viscous sub-layer and the buffer layer escape notice altogether. Fig. 1–9*b* shows a side view of water passing from a lake into a horizontal channel, and it seems to be implied that the above formulae hold good without modification. But now the equation of continuity must be satisfied; and if the Froude number exceeds about 0·5, waves fixed in space appear on the free surface.

There are a number of worked examples, and a valuable feature is the list of references to be found in most of the chapters. There are said to be more than 400 problems, but except where the answer is embedded in the question itself, no answers are provided; thus a trap is set for the unwary purchaser. In some walks of life, harsh terms such as obtaining money by false pretences might be used. Here it is more charitable to remark that the publisher must have been careless in his supervisory duties and the author prematurely exhausted by his labours. A consequence of this omission can be seen in the account of the momentum principle (pages 10–11), which many find difficult. The author propounds the problem of an obstacle fixed in a contraction, and blandly adds that "the details are left as an exercise for the reader (Prob. 1.5)". This problem, however, turns out to be numerical with no answer given, and so the eager student is baffled in his attempt to master the fundamental principle. The book gives glimpses of really difficult topics such as cnoidal waves, but its chief value will be as a work of reference for civil engineers seeking help on advanced matters, although inevitably it cannot carry the authority of a work compiled by specialists each describing his principal field of interest. It cannot be recommended to a student working on his own.

A. M. BINNIE

SIDGWICK RETURNS

The Organic Chemistry of Nitrogen

By N. V. Sidgwick. Third edition newly revised and re-written by Ian T. Millar and H. D. Springall. Pp. xii+909. (Oxford: Clarendon Press; London: Oxford University Press, 1966.) 168*s*. net.

THE authors of this new edition of Sidgwick's *Organic Chemistry of Nitrogen* faced a formidable task. The first edition (1910; 415 pages), which became a classic, was based on lectures given to undergraduates at Oxford, and Taylor and Baker's edition (1937; 590 pages), long out of print, contained more facts and less critical appraisal. Now this long-awaited, impressive, beautifully produced, third "Sidgwick" is published but, alas, at a price which virtually no undergraduates and few of their tutors can afford.

In a preface, to which Millar and Springall refer in their own preface, Sir Cyril Hinshelwood wrote "in some ways the ideal would be that successive editions of a book should get smaller and smaller". There is much to be said for this view and one is forced to ask whether the Clarendon Press was right to publish so expensive an edition of "Sidgwick" at all, or whether the authors should have been asked to write a modern text-book, comparable in size and scope to the original "Sidgwick", which students will buy and use from cover to cover.

In the present work the functional-group chemistry is much more comprehensive and detailed than is necessary for the honours student, though the heterocyclic section is tailored rather more nearly to his requirements. On natural products he will find excellent chapters on proteins and peptides and on nucleic acids, but little on the vitamins *B*, nothing on porphyrins and very little on alkaloids. Certainly the topics included are of major interest today, but this makes it likely that accounts of these rapidly developing subjects will need revision more frequently than anyone can afford to replace this costly book.

It is appropriate that Dr. L. E. Sutton's delightful appreciation of Sidgwick is reprinted here. The author index, which the authors say is not fully representative, could have been dispensed with. M. L. TOMLINSON

SOLVENT SYSTEMS

The Chemistry of Non-Aqueous Solvents

Edited by J. J. Lagowski. Vol. 1: Principles and Techniques. Pp. xi+403. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1966.) 132*s*.

THIS book is intended to be the first volume of a multi-volume treatise, but so far only one more volume has been announced. It contains seven chapters on various general aspects of non-aqueous solvents, each by a different author, and with no obvious co-ordination between them. The first chapter, by Devon W. Meek, describes Lewis acid-base interactions with the solvent and between solute