Anyone who intends to use the PLTMG software will need a copy of this book. Despite the aforementioned deficiencies, the book contains all the information needed to solve complicated boundary value problems, and is written in a clear, easy-to-understand style.

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23[65M55, 65N55].—P. W. HEMKER & P. WESSELING (Editors), *Contributions to Multigrid*, CWI Tract, Vol. 103, Centre for Mathematics and Computer Science, Amsterdam, 1994, viii + 220 pp., 24 cm. Price: Softcover Dfl. 60.00.

From the Preface: This volume contains a selection from the papers presented at the Fourth European Multigrid Conference, held in Amsterdam, July 6–9, 1993.

J. H. B.

24[65L05].—LAWRENCE F. SHAMPINE, *Numerical Solution of Ordinary Differential Equations*, Chapman & Hall, New York, 1994, x + 484 pp., $23\frac{1}{2}$ cm. Price $64.95.

That so many books with more or less this same title have appeared in recent years might lead one to expect nothing new in this volume. This is far from the case. Numerical methods for differential equations is a very difficult and important subject and, while its literature is extremely rich, it is far from mature. Recent textbooks, and more so monographs, are not so much personal expositions of a well-defined body of work but personal contributions to the development of a vital and rapidly-changing research area. Lawrence Shampine has been a significant contributor to the theory and practice of solving differential equations numerically for 20 years and it is his style, developed and honed through his own research and experience, that is stamped on this book.

The book is divided into eight chapters of which the first three are of an introductory nature. The first deals with "The Mathematical Problem" (of solving ordinary differential equations), the second with "Discrete Variable Methods", and the third "The Computational Problem". Chapter four on "Basic Methods" is followed by the theory of "Convergence and Stability". The last three chapters are on "Stability for Large Step Sizes", "Error Estimation and Control" and "Stiff Problems".

References are collected together for standard literature, works actually cited, and codes referred to. The book concludes with a brief appendix on mathematical tools used in the book.

The subject of solving differential equations numerically is a mix of theoretical knowledge, practical insight and computational technique. In the Shampine style, software is also an essential component and it is the balance in emphasis