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BOOK REVIEWS

BULTHEEL, A., GONZÁLEZ-VERA, P., HENDRIKSEN, E. AND NJÅSTAD, O. *Orthogonal rational functions* (Cambridge Monographs on Applied and Computational Mathematics, vol. 5, Cambridge, 1999), xiv + 407 pp., 0 521 65006 2 (hardback), £37.50 (US$59.95).

The connections between moment problems, corresponding continued fractions, rational approximations and orthogonal polynomials are classical, and there have been numerous excellent texts on these topics throughout most of the 20th century. These topics have now been studied very intensely and there are many different and detailed results available in a number of generalizations of the original theory, including those that generalize orthogonal polynomials to orthogonal rational functions. As the authors of this book state, it would be impossible to treat in one volume all of these generalizations from polynomials to rational functions. The four authors, and there are very few better qualified to write a monograph in this area, have thus wisely chosen to restrict the content to an introduction to the topic, followed by a treatment of the generalizations of classical interpolation problems of Schur and Carathéodory types, of quadrature formulae and of moment problems. In doing so, as have numerous authors before them, they accentuate the natural links between interpolation, quadrature and moment problems. As a result of their work they have now contributed one more extremely well-written text that I believe will be welcomed by all those whose interests are in this area, but also one that will be both very readable and very informative to a wider group of researchers. Since the subject has applications in system theory and electrical engineering, it is not only mathematicians who could appreciate the book.

There are 12 chapters. The first two deal with the necessary preliminaries and the relevant fundamental spaces. The material in the subsequent chapters includes coverage of such topics as kernel functions and recurrence functions, quadrature, interpolation, convergence and moment problems. There is also a chapter devoted to the boundary cases, distinguishing between the two possibilities of the boundary being the unit circle or the extended real line. This is followed by a final chapter on some very interesting applications. The 12 chapters are sandwiched between an excellent and comprehensive introduction and an equally useful conclusion. The bibliography at the end of the text contains a well-selected list of just over 200 articles.

The text is written with great clarity and the order in which the material is presented is well designed. A book with four authors is not common, but these four, each of whom is well known for his own published research, have combined very successfully in this joint venture and are to be applauded for their achievement.

J. H. McCABE

CRABB, M. C. AND JAMES, I. M. *Fibrewise homotopy theory* (Springer Monographs in Mathematics, Springer, 1998), viii + 341 pp., 1 85233 014 7 (hardcover), £49.50.

Fibrewise homotopy theory is a part of fibrewise topology, the study of spaces equipped with maps to a fixed base space B. A space X with a map $p\colon X \to B$ is called a fibrewise space