nonlinear eigenvalue problems, notions of Fredholm operators, periodic solutions of Hamiltonian systems, saddle points of nonquadratic functionals are among the important topics not discussed.

The mathematical community owes a debt of thanks to Fucik and Kufner, the two Czech authors of this book. They have produced a readable account of important contemporary topics in nonlinear analysis. These days, so much important research of our best people is dribbled out of them, piecemeal, in the form of imperfectly developed journal articles and conference proceedings. Let us hope that in the near future, other highly talented mathematicians of nonlinear science will be afforded the opportunity and leisure to share with us their finest conceptions in the form of systematically developed books, accessible to a wide mathematically educated audience.

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The symmetric eigenvalue problem, by Beresford N. Parlett, Prentice-Hall Series in Computational Mathematics, Prentice-Hall, Englewood Cliffs, N. J., 1980, xix + 348 pp., $ 25.00 cloth.

The thesis of this review may be summarized in three propositions. First, numerical analysis is a science with mathematical, empirical, and engineering components. Second, a conventional mathematical education does not equip one to deal with the last two components. Third, the book under review is a good place for a mature mathematician to get an appreciation of all three aspects of the subject.

At the outset I would like to correct a possible misapprehension. For most of this essay, I am going to focus on the nonmathematical aspects of numerical analysis. This does not mean that I wish to minimize the role of mathematics in numerical analysis; on the contrary, it is hard to overstate its importance. But the pure mathematician coming to the field for the first time will find much that is strange, and I hope this review will provide a brief guide to this extra-mathematical territory.

The mathematical component of numerical analysis scarcely needs arguing. The subject derives its analytic tools from many branches of mathematics. Its journals usually present results in the form of theorems, the coin by which mathematical productivity is currently measured. Nor are these theorems more trivial or less rigorously established than those of other branches of mathematics. Finally, most numerical analysis courses are listed in mathematics departments, perhaps jointly with a computer science department.

The empirical component of numerical analysis derives from the fact that numerical analysis is a branch of applied mathematics, and its results are therefore subject to outside verification. In general, an applied mathematician must look on a piece of experimental apparatus with a mixture of hope and trepidation, since it can confirm or deny his researches with unarguable