29 [3].—M. LUNELLI, Editor, *Una Biblioteca de Sottoprogrammi dell'Algebra Lineare*, Franco Angeli, Editore, Milano, 1972, 429 pp. Price: Lit. 12000.—.

A collection of Fortran programs derived from *The Algol Collection in Linear Algebra* by Wilkinson and Reinsch.* The first half of the book introduces and discusses the methods and relevant perturbation theory—all in Italian.

B. P.

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30 [3].—J. H. WILKINSON & C. REINSCH, *Handbook for Automatic Computation.* Vol. II, *Linear Algebra*, Springer-Verlag, New York, 1971, ix + 439 pp., 24 cm. Price $20.80.

Those with a strong interest in numerical linear algebra will already be familiar with some of the algorithms given in this book. In this review I shall try to address an imaginary SIAM member who is not very interested in the subject but who wishes to know when something important has happened, which topics are receiving most attention, and which of them are dead.

This important reference book presents 82 procedures written in an official subset of the language ALGOL 60 to perform a variety of well-defined tasks in solving linear systems of equations or in finding eigenvalues and eigenvectors. With each algorithm there is a brief discussion of its scope, the relevant theory, special features, numerical properties and test results. This collection represents continuous efforts by acknowledged experts over more than ten years. The algorithms have been pre-published individually in Numerische Mathematik and thus have been subject to public scrutiny and usage. In a real sense this anthology defines the state of the art in this domain, although Wilkinson hastens to say that he is not claiming that these programs are the last work on the subject.

It is only proper to hand out bouquets to the authors for creating this landmark and for setting such high standards of performance and documentation. One of the pleasant aspects of the effort has been the friendly cooperation on an international scale, a contrast with the intensely individual and competitive atmosphere in the world of mathematics.

The appearance of this book raises a number of interesting questions.

Why has it taken nearly fifteen years to implement decent programs in a subject which was finished off by the beginning of the century and has become a standard part of all undergraduate training in the physical sciences and engineering? It is one thing to learn that you cannot just say Newton's method when the subject of polynomial zeros is raised. It is quite another matter to provide a zero finder which will cope with most eventualities, never lie, and not be too clumsy. When a mathematician

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* See following review.