Many of these applications share the same basic kinds of mathematical models: finite difference methods, spectral methods, or particle methods, which in turn lead to systems of linear equations, FFTs, and PIC algorithms. As a result, there were many independent papers on dense linear algebra (block algorithms, matrix communication libraries, parallel eigenvalue, singular value, and least squares algorithms) and sparse linear algebra (sparse matrix-vector multiply and Krylov subspace methods, reordering matrices to reduce fill during elimination, multifrontal methods, and the sparse simplex algorithm). Some of the other numerical methods addressed include domain decomposition, graph partitioning, fast Poisson solvers, constrained optimization, random number generation, interval Newton, and discrete time optimal control.

There were also a large number of papers on parallel programming tools, including load partitioners for mesh and particle methods, distributed object libraries, parallel Fortran and other parallel programming languages and constructs, tools for heterogeneous network computing, communication algorithms, load balancing, scheduling, partitioning, performance modeling, architecture and visualization.

Finally, there was a session on education, including free courseware available electronically for undergraduate courses on parallel computing.

J. W. D.

35[68–06, 68Q40].—THOMAS LEE (Editor), *Mathematical Computation with Maple* V: *Ideas and Applications*, Birkhäuser, Boston, 1993, viii+199 pp., 28 cm. Price: Softcover $34.50.

This is a proceedings of a summer 1993 workshop and symposium conducted by the Waterloo Maple Software company, vendors of the Maple V computer algebra system.

The papers are grouped according to their general topics: introduction of computer algebra systems in educational situations (calculus, engineering, physics): 6 papers; exposition on using Maple for specific tasks in applied mathematics, science, and engineering: 13 papers. Two papers on solids modeling struck this reviewer as particularly interesting.

The education papers (and their references) may be of particular use to faculty considering introducing a computer algebra system (Maple, Mathematica, or some other program) into their curriculum.

RICHARD J. FATEMAN

Computer Science Division, EECS Dept.
University of California
Berkeley, CA 94720

36[01A75, 11–03].—D. MCCARTHY (Editor), *Selected Papers of D. H. Lehmer*, The Charles Babbage Research Center, Winnipeg, Canada, 1981, 3 vols., ixx+368 pp., 429 pp., 341 pp., $23\frac{1}{2}$ cm. Price $105.00 hardcover, $72.00 paperback (for the set).

The issuing of this three-volume set in 1981 has given to the mathematical world a collection of the major writings of one of the foremost computational

mathematicians of our time. These volumes contain photocopies of 118 of the 151 works of the author published between 1925 and 1978. (The complete bibliography of 181 papers can be found in [1, pp. 215–220].) The selection of papers was made by Lehmer himself—some articles contain hand-written corrections and addenda of the author—who further divided the papers into 17 subsections by subject. Each of these begins with an introduction written by Lehmer, in which he comments on mathematical and historical aspects of the papers in that section. The subsections are distributed among the three volumes as follows (the number of papers in each subsection is given in parentheses):

> Volume I. 1. Lucas' Functions (4); 2. Tests for Primality (8); 3. Continued Fractions (5); 4. Bernoulli Numbers and Polynomials (3); 5. Diophantine Equations (7); 6. Numerical Functions (12).
> Volume II. 7. Matrices (7); 8. Power Residues (5); 9. Analytic Number Theory (10); 10. Partitions (5); 11. Modular Forms (8); 12. Cyclotomy (8).
> Volume III. 13. Combinatorics (6); 14. Sieves (7); 15. Equation Solving (4); 16. Computer Techniques (8); 17. Miscellaneous (11).

The hardbound volumes are a beautiful blue and contain 368, 429, and 341 pages respectively. Volume I contains a rather stark, black-and-white photo of Lehmer in bright light (taken around 1980), a bibliography of 156 items, a short preface, a few comments about the author by J. L. Selfridge and R. L. Graham, and a table of contents. There is no introduction to the collection as a whole, so that the usual connected historical account of the author and his work is missing. (For such an account, see [1, pp. 207–213].) The title is missing on the first paper. Volumes II and III have no introductory material other than the subsection introductions. The three volumes would have been easier to use if the number of each paper from the bibliography had been put on each paper and if each volume had been given its own table of contents. (These volumes are still available in hard or soft cover from The Charles Babbage Research Centre, P. O. Box 272, St. Norbert Postal Station, Winnipeg, Manitoba R3T 2N2, Canada.)

It should be mentioned that the author of these papers possessed great personal charm and a wonderfully dry sense of humor, both of which show through in his writing. This is the man who once told the students in his history of mathematics class (much to their amusement) that algebra accidentally came to Europe during the middle ages in the saddlebag of a returning crusader who had forgotten to burn the book.

If you pick up one of these volumes and start reading, you will find something that will interest you. Here is real mathematical artistry combined with the substantive insights that come from focused computing. The level is that of basic research, the kind that Euler and Ramanujan did. These papers are fundamental contributions to mathematics.

JOHN D. BRILLHART

Department of Mathematics
University of Arizona
Tucson, AZ 85721

1. J. Brillhart, *Derrick Henry Lehmer*, Acta Arith. **LXII.3** (1992), 207–220.