the Linear Mathematics course: vector spaces, linear transforms, Hermite normal form, differential equations I, eigenvalues, recurrence relations, numerical solution of $Ax = b$, homogeneous differential equations, Jordan normal form, non-homogeneous differential equations, linear functionals and duality, bilinear and quadratic forms, affine geometry and convex cones, inner product spaces, linear programming, least-squares approximations, convergence, numerical solution of ODE's, Fourier series, wave equation, orthogonal and symmetric transformations, boundary value problems, Chebyshev approximation, theory of games, Laplace transforms, numerical solution of eigenvalue problems, differential equations II (resonance), heat conduction, existence and uniqueness theorems.

With each unit comes a 50-page paperback booklet whose style reflects the absence of teaching assistants, office hours, and discussion sections. There are plenty of exercises, lots of pictures, and, what is most striking, frugality in the exposition. This last comment is intended to be a compliment: often a text presents too many results and the student is given no perspective on them. In these booklets, the key facts are set down clearly, with proofs where appropriate. Frequent use is made of summaries and glossaries.

The units appear to be excellent for self-instruction, and sell for about $3.00 each. The prerequisite structure of units within each course is indicated pictorially on the cover. However, these units are not always self-contained. Two specified texts (from the U. S. A.) are needed for the Linear Mathematics course.

The unit on Chebyshev approximation, for example, has three sections: best polynomial approximations, Chebyshev polynomials and Chebyshev series. Subsections on the Remez algorithm and the computation of Chebyshev coefficients are optional. This unit is almost entirely independent of the two textbooks, whereas the Fourier series unit is essentially a commentary on one of the textbook's treatment of the subject.

There are films supplementing each unit: $125 for black and white, $275 for color. The cassettes were priced at $7.50 each.

Britain's experiment in higher education without a campus will probably be watched with apprehension by academics and with keen interest by state legislators. * The idea does seem particularly relevant to adult education and retraining.

B. P.

18 [2.00, 3, 4, 5, 6, 8, 12].— GERMUND DAHLQUIST & ÅKE BJÖRCK, translated by NED ANDERSON, *Numerical Methods,* Prentice-Hall, Inc., Englewood Cliffs, N. J., 1974, xviii + 573 pp., 24 cm. Price $15.95 (clothbound).

This is a remarkable textbook as well as a handbook for scientific computation. It is filled with well-written, succinct descriptions of methods and algorithms, together with mathematical analyses, practical observations, splendid exercises, and references to the literature for more detailed treatments. The scope of the topics (as indicated in the chapter headings that are listed at the end of this review) is greater than I would have thought to be feasible in a volume of this size. Nevertheless, the authors succeed admirably. The verbiage is kept to a minimum, so that it is easy to find clear explicit descriptions of the methods. This feature should make it possible to use the work as a handbook and as a text in an undergraduate numerical methods course, where the emphasis is on learning how to solve problems, rather than on the mathematical analysis

* No riots, no panty raids, no library.

of the procedures. On the other hand, for users with a good background in calculus, linear algebra, and ordinary differential equations, the book makes it possible to become expert in numerical analysis by reading the text and doing the excellent problem sets that follow each major section. Solutions for most of the exercises, appear in Chapter 12. The authors present a wise balance of small-scale and large-scale computing methods. An instructor would have to make a judicious selection of the material to be covered by his class, since the book contains such a wealth of material treated with varying levels of mathematical sophistication.

This book is a beautifully written and improved translation of the authors' Swedish work published in 1969. The translator, Ned Anderson, is credited by the authors with improving the presentation. The chapter headings are:

E. I.

19 [2.05].– G. G. LORENTZ, Editor, in cooperation with H. BERENS, E. W. CHENEY, L. L. SCHUMAKER, *Proceedings of an International Symposium Conducted by the University of Texas and the National Science Foundation, January* 22–24, 1973, Academic Press, Inc., New York, 1973, xiii + 525 pp., 24 cm. Price $17.00.

These proceedings contain six long articles and forty-nine shorter articles (eight typed pages maximum length). The shorter articles cover the entire field of approximation theory and include announcements of new results, summaries of previous work, and short research papers complete with proofs.

The long article by P. L. Butzer is a survey of the recent work by his colleagues in Aachen. There are eight books and 101 papers cited in the references, not counting works from outside Aachen. This seventy-page paper has nine distinct parts, the first four of which are the longest. These are

Basic approximation theory
Semigroup related results
Fourier analysis on R^n
Fourier analysis in Banach spaces
Approximation on compact manifolds