indicates, but primarily numerical methods for partial differential equations. Modern methods, for example, finite elements, fast Fourier transform, and the method of large particles (particle-in-cell method) are discussed or mentioned, while a large part of the book is devoted to the powerful splitting-up method. This method is based on the formal relations

$$e^{(A_1+A_2)\Delta t} = e^{A_1\Delta t}e^{A_2\Delta t} + O(\Delta t)^2$$

and

$$e^{(A_1+A_2)\Delta t} = e^{A_1\Delta t/2}e^{A_2\Delta t/2}e^{A_2\Delta t/2}e^{A_1\Delta t/2} + O(\Delta t)^3$$

which permit the problem $u_t = (A_1 + A_2)u$ to be solved as a sequence of simpler problems.

I do find one fault with this book. It paints too rosy a picture of computational physics. Only the most serendipitous practitioner will be able to use successfully some of the recommended methods on complicated problems. A better balance would have resulted with the inclusion of a chapter on ways of analyzing the effectiveness of a scheme; phase error analysis, operation counts, long-time stability properties, and detailed truncation error analysis. Such a chapter might also have included some numerical results to show the bad answers that some apparently good methods can produce.

BURTON WENDROFF

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Funktionalanalysis, by Harro Heuser, Mathematische Leitfäden, B. G. Teubner, Stuttgart, 1975, 416 pp.,

Geometric functional analysis and its applications, by Richard B. Holmes, Graduate Texts in Mathematics, No. 24, Springer-Verlag, New York, Heidelberg, Berlin, 1975, x + 246 pp., $16.80.

Functional analysis, by Michael Reed and Barry Simon, *Methods of modern mathematical physics*, vol. I, Academic Press, New York and London, 1972, xvii + 325 pp., $13.50.

Methods of modern mathematical physics, vol. II, *Fourier analysis, self-adjointness*, by Michael Reed and Barry Simon, Academic Press, New York, 1975, xv + 361 pp., $24.50.

These are three quite different introductions to functional analysis, addressed to different constituencies; all three are intended for use as graduate level textbooks, with varying demands on the reader's mathematical background. Heuser's book is appropriate for general mathematics students as well as future specialists. Holmes' book stresses Banach spaces and applications to optimization theory. Reed and Simon's series (apparently projected for at least five volumes) is an exposition of functional-analytic methods in modern mathematical physics. In different ways, these books are all written admirably, but I confess that for sheer craftsmanship and pedagogical judgement, my heart belongs to Heuser.