generates a strongly continuous group of operators, he can use methods from the theory of semigroups, instead of those of Banach algebras no longer available. Versions of the operational calculus and spectral decompositions, localized to some linear manifolds, for operators with real spectrum conclude this exposition.

The material is well written, the style is alert and attractive, despite the unavoidable technical portions. Many proofs are nice pieces of fine analysis. The author presents an original, interesting and consistent point of view concerning the spectral theory of linear operators, especially of those having real spectrum. The reviewer has several reasons to believe that the spectral theory of linear operators has much to gain from the systematic study of operators with "thin" spectrum, in particular of those with real spectrum. The present work is a remarkable illustration of this assertion.

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The Cauchy problem, by H. O. Fattorini, Encyclopedia of Mathematics and its Applications, Volume 18, Addison-Wesley, Reading, MA, 1983, xxii + 636 pp., $69.96. ISBN 0-201-13517-5

About three hundred years ago Isaac Newton taught us that the motion of a physical system is governed by an initial value problem or *Cauchy problem* for a differential equation, and the notion of Cauchy problem has been developing ever since. Here the phrase *differential equation* should be interpreted broadly so as to include systems of partial differential equations, integrodifferential equations, delay differential equations, and other kinds of equations. Most, but not all, of the Cauchy problems that arise "naturally" are *well-posed problems* —that is, problems for which a solution exists, is unique, and depends continuously on the ingredients of the problem. These requirements often necessitate imposing auxiliary conditions, such as boundary conditions, on a given Cauchy problem.

Of special interest are *linear* equations. There are two reasons for this. Firstly, many equations, such as the Schrödinger equation of nonrelativistic