it is more useful for learning the essentials of the subject than for gaining an overview of the state of the subject at the present time, despite the multitude of asides and context-placing references. The main thrust of the book is to work up from the idea of the index of a Fredholm operator on Hilbert space, through the introduction of pseudo-differential operators to the second proof of the index theorem, yielding the index in $K$-theory. The organization of the material is generally good, with theories and techniques brought in for the attainment of specific goals and not for their own sake. One slight hiccup in the linear organization is that $K$-theory gets defined twice, and if we include the gauge-theoretic section, Sobolev spaces on manifolds are defined twice also (and in different ways!). Nevertheless, the book provides a proof of the index theorem and a good description of what it can do.

Times move on, of course, and the more recent proofs of the index theorem which are motivated by supersymmetry provide a rationale for the role which functions like $x/(1 - e^{-x})$ and $x/\tanh x$ play in sorting out the combinations of characteristic classes which occur in the index formula. By now workers in partial differential equations, stochastic processes, Riemannian geometry, algebraic geometry, algebraic topology and mathematical physics all have the index theorem doing something for them. In another twenty years the list will almost certainly be longer.

Like Stonehenge, the theorem stands there as an immovable edifice, with each generation giving its own interpretation. For one it is a computational device, for another a more mystical representation of supersymmetry. Either way, it has created a bridge between mathematics and physics and has given mathematicians and physicists a deeper, or at least more sympathetic, understanding of each other's work. The Dirac operator will never be reinvented a third time!

NIGEL J. HITCHIN

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*Sequence transformations and their applications*, by Jet Wimp, Mathematics in Science and Engineering, vol. 154, Academic Press, 1981, xix + 257 pp., $38.50. ISBN 0-12-757940-0

In this volume the author restricts himself mostly to material on sequence transformations which has not appeared in book form in English. Some of the material is available in French (Brezinski, 1977, 1978), but much of the material has never appeared in book form in any language. Some has not appeared in published papers [the thesis work of Higgins (1976) and Germain-Bonne (1978) for instance], and much is new altogether.

The subject of this book touches virtually every area of analysis, including interpolation and approximation, Padé approximation, special functions, continued fractions, and optimization methods, to name a few.