

the theory of a certain class of stochastic processes motivated by models for learning. It will certainly be well received and appreciated.

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K. B. ATHREYA AND P. E. NEY, *Branching Processes*. Springer-Verlag, Berlin, 1972, 287 pp.

Review by JOHN A. WILLIAMSON
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The authors in their preface state clearly their purpose in writing the book, "to give a unified treatment of the limit theory of branching processes." They hold to their purpose and generally accomplish their end.

The authors concentrate on the decade between the publication of Harris' book (T. E. Harris, *The Theory of Branching Processes* (1963)) and their own. Referring to Harris, the authors write, "only enough material is repeated to make the treatment essentially self-contained. For example, certain foundational questions on the construction of processes to which we have nothing new to add are not developed." The reader can find in this book the classical limit laws, most appearing in their sharpest form, as well as recent new results, and all are presented in a way that can only be called elegant. The emphasis in the book is on single-type processes with the first two chapters devoted to the Galton-Watson process and the next two to the continuous time Markov and Bellman-Harris age-dependent branching processes. Multi-type processes are discussed only in the fifth chapter where, appropriately, the reader is referred to Harris for several proofs.

The basic techniques of functional iteration, of martingales, of convex function bounding, of Taylor's Series remainder estimates, of renewal equation analysis, and of comparison lemma manipulation, together with refinements, are all there for the reader to master. The authors have an interest in, and great facility with, technique. The technical high point, not surprisingly, is their Chapter IV on the age-dependent process.

Having expressed a general enthusiasm for the book, I want next to attempt to identify that group of readers for whom the book will be of most interest, and then finally to discuss what I feel is one serious omission.

This book is definitely required reading for any person intending to attempt research in the branching processes area as well as for anyone who plans only to keep abreast of the literature in this field. Not only do the contents of the various chapters equip the reader for these undertakings, but the problem sets at the end of each chapter provide several open questions and many challenges that test whether the reader has grasped the techniques of the chapter. (Since