BOOK REVIEWS

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E. B. Dynkin, *Markov Processes*, Volumes I and II. Translated by J. Fabins, V. Greenberg, A. Maitra and G. Majone. Springer-Verlag, Berlin (distributed in the U.S.A. by Academic Press, New York), 1965. xii + 365 pp.; viii + 274 pp.; $24.00.

Review by Ronald K. Getoor

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During the past dozen years or so the theory of Markov processes has been enjoying a period of extremely fruitful and vigorous growth. The work of Professor Dynkin and his associates in the Soviet Union has been of the greatest importance during this period. The volumes under review are an attempt at a systematic exposition of the modern theory of Markov processes. On the whole, this attempt has been very successful. The present volumes together with Professor Dynkin's earlier book, "Die Grundlagen der Theorie der Markoffschen Prozesse", Springer Verlag (1961), contain a fantastic wealth of information about Markov processes and undoubtedly they will be the standard reference in this field for many years to come. These volumes, although much easier reading than the earlier book, are still difficult and can hardly be recommended for the novice. The prospective reader should come well armed with a thorough knowledge of the modern theory of measure and integration and probability theory at roughly the level of Loève. Also the reader should be able to supply his own examples as there are relatively few provided by the author. But to a reader with this background and a desire to learn the modern theory of Markov processes these volumes should prove invaluable. Although the English translation is printed in two volumes this work is really one book and appeared as such in the original Russian edition. (Moscow 1963.)

For the most part the author strives to present each result in as general a setting as possible. However praiseworthy this may be, it has a tendency to make the book even more difficult for the beginner. This is compounded by the fact that for the proofs of several of the key results (especially in Chapters Three and Four) the reader is referred to the author's earlier book. On the other hand there are several places where more generality would have been very welcome—e.g. the reviewer was disappointed that in Theorem 5.11 the author restricted his attention to Euclidean space rather than a general differentiable manifold. Finally the numbering system employed is not conducive to easy reference since theorems, corollaries, and lemmas are numbered independently.

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Thus to find Theorem 5.11 it is necessary, at least for the reviewer, to thumb through all of Chapter Five.

In a book of this magnitude there are bound to be a number of minor inaccuracies. The following are among those noted by the reviewer. Theorem 2.1 is not correct as stated. It is necessary to assume that $\{T_t f_n\}$ decreases to zero pointwise whenever $\{f_n\}$ does so. Lemma 0.7 in the Appendix isn't valid unless u is assumed to be continuous. In the statement of Theorem 12.10 condition 10.3A should be replaced by 10.4A. In the statement of Theorem 12.13 "if and only if" should be replaced by "if". This result is correctly stated in the original Russian edition. The number of misprints seems to be small and the typography is excellent.

In conclusion this book is an important contribution to theory of Markov processes and should prove to be an extremely valuable tool for research workers and serious students.