Krein, and the technicalities are more involved, but the general features of the solutions are similar to those for Krein's problem.

The reviewer is in the uncomfortable position of not being an expert in prediction theory, the main topic of the book under review. Rather, I am someone who was brought up in Hardy spaces and developed a curiosity about how they get involved with prediction theory. For such a person the book is almost ideal. I imagine the same would be true for someone reared in probability theory who developed the complementary curiosity to mine. The book begins with three short but intense preparatory chapters which provide the needed background in function theory, Hardy spaces, and probability. The fourth chapter deals with various prediction problems, beginning with the Kolmogorov-Wiener problem mentioned above. The central theme is an effort to express in terms of the spectral measure Δ the amount of dependence between the past and the future of the process. In the two remaining chapters, Krein's theory of strings and its connection with de Branges spaces of entire functions are developed in detail and applied in the manner sketched above.

I found the comparatively informal style of the book congenial and effective. Many details of proofs are left to the reader in the form of carefully prepared exercises. The authors have clearly made an effort to write a book that will be of value to the learner. If my experience is typical, they have succeeded.

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Probability methods for approximations in stochastic control and for elliptic equations, by Harold J. Kushner, Academic Press, New York, San Francisco, London, 1977, xvii + 243 pp. $23.00.

The analysis of the transition from Markov chains to diffusions, the convergence of solutions of difference equations to corresponding ones for differential equations and related approximation problems have been studied intensively for many years and appear frequently in so many different specialized contexts that it is practically impossible today to have a comprehensive idea of what goes on in the field. Kushner's work aims directly at a specific class of approximations for optimal diffusion processes which are associated with partial differential equations (PDE). In this way he limits the material to manageable size which one can divide, roughly, into two parts.

The first one is the content of Chapters one to seven and Chapter ten and deals with background material, the theory of weak convergence of measures (without details), and the convergence of (nonoptimal) chains to diffusions. The second part, the main point of the book, is the content of Chapters eight and nine and deals with the approximation of optimal diffusions. Chapter eleven deals with a special topic, the separation theorem of stochastic control.

Let us look into part one in some detail. The beginning of the theory of approximations of Markov chains by diffusions is probably the well-known work of Khinchine [1]. The analysis here is simple and direct. It is based on