$$\exp\left[i\int \phi(t+\tau)dx(\tau,\alpha)\right]$$

and

$$\exp\left[i\,\epsilon\int\int K(t+\tau_1,t+\tau_2)dx(\tau_1,\alpha)dx(\tau_2,\alpha)\right].$$

These are expanded in orthogonal series and their covariances and spectra determined (it should be noted that some of these results can be found easily by standard methods). In two other lectures the author applies his method to the analysis and synthesis of a four-terminal electrical network. An empirical analysis is sketched which involves the ingenious device of generating Laguerre polynomials electrically with lattice networks, to use as kernels for the polynomial functionals.

This book provides some rather novel methods of attack on a class of difficult problems. In the reviewer's opinion, it should prove to be stimulating and useful reading for a considerable group of applied mathematicians, engineers, and physicists.

WILLIAM L. ROOT

Information theory and statistics. By Solomon Kullback, New York, John Wiley and Sons, Inc., 1959. 18+395 pp. $12.50.

Kullback and Leibler elaborated a definition of the information contained in an experiment to distinguish between two hypothetical distributions on a sample space. The original definition was given by Wiener in his *Cybernetics* and is formally a generalization of the one by Shannon, which is motivated by communication theory considerations and is justified by the nontrivial coding theorem for channels. The book under review does not attempt to generalize Shannon's theory but is concerned with the properties of the generalized information measure as a statistic in testing of hypotheses.

SEYMOUR SHERMAN

Probability and related topics in physical sciences. By Mark Kac, with special lectures by G. E. Uhlenbeck, A. R. Hibbs and Balth. van der Pol. Lectures in Applied Mathematics, vol. 1. New York, Interscience, 1959. 13+266 pp. $5.60.

What is the probability that a mathematics book (chosen at random?) will be informative, clearly written, and delightful to read? Although Professor Kac does not consider this question in his recent book, he clearly demonstrates that the set of such books is nonempty.