and applied mathematician, who has, however, devoted considerable attention to scientific methodology and states his views in this field with considerable confidence and spirit.

Jeffreys wrote his book in the first place to "provide a method of drawing inferences from observational data that will be self-consistent and can also be used in practice". He was rather impatient with the notion that the so-called common-sense view of probability is inadequate for practical scientific applications and cannot be given a consistent mathematical treatment. He still is! Consequently, the basic development in the third edition remains the same as that in the first. Certain new proofs have been added and others are presented in greater detail. There has been a certain amount of rearrangement of material to strengthen the logical argument.

Professor Jeffreys is principally interested in the use of probability as a measure of the probable validity of physical laws in serving as descriptions of experience and as a means for providing the best estimates of parameters occurring in these laws. His work will continue to contain more value and interest for experimental physicists. It is unlikely that theoretical physicists will be helped by his program. He inveighs against frequency theories of probability at some length, and though he admits that the results of statistical mechanics are for the most part good, he considers the foundations to be wrong. Jeffreys has no use, for example, for the Gibbs ensemble concept. Nevertheless, the latter has had great influence on the applications of statistical mechanics. Of course, it is subject to criticism, but its critics might be advised to read once more the preface of Gibbs' famous little book, *Elementary Principles in Statistical Mechanics,* to recall precisely what he set out to do.

The careful reader of Jeffreys' book will probably conclude that it is not merely the problem of the most effective and valid definition of probability which is involved, but also the more fundamental question of the nature of a scientific theory. The bold use of the imagination in dreaming up new physical constructs and postulates has carried modern physical theorizing far beyond the stage which it seems likely that Jeffreys, with his continued emphasis on "inductive inference", will be willing to accept.

The style of the author is clear, elegant, and incisive, even when dogmatic, and his book continues to be a pleasure to read.

The Fourier Integral and Its Applications. By Athanasios Papoulis. 318 pp. McGraw-Hill Book Co., Inc., New York, 1962. $10.75. *Reviewed by A. A. Maradudin, Westinghouse Research Laboratories.*

THE applications referred to in the title of this book are all to be found in electrical engineering. Consequently, some physicists may be put off from reading it. This would be a pity, I think, because I found Professor Papoulis' book to be a very good in-

troduction to many applications of the Fourier integral. The Fourier integral studied in this book is the integral with respect to time; no discussion is given of the Fourier integral with respect to space variables. It should be said at the outset that this is not a book for mathematicians, and some theoretical physicists may possibly find it a bit lowbrow. The audience to which it is addressed consists of electrical engineers and applied scientists who are interested in using the Fourier integral as a practical tool for solving concrete problems which arise in their work. Little in the book is new, but it contains a wealth of material relating to the Fourier integral collected in one convenient reference.

Professor Papoulis has not gone out of his way to make concessions to his readers and his book is more "mathematical" than many. Very few theorems are prefaced by the phrase all too commonly found in books dealing with the applications of mathematical techniques, "It can be shown that . . .". In fact, a particularly satisfying feature of the book, at least for this reviewer, is the attempt by its author to provide clear and simple proofs of most of the purely mathematical theorems used, and this can only be beneficial for their subsequent applications.

The book is divided into four parts. The first is essentially introductory in nature. Basic properties of the Fourier and Laplace transforms are presented, and extensive use is made of the delta-function and other singularity functions to simplify the presentation. Linear systems, with emphasis on filters, are discussed in the second part of the book, while in the third part the analytic properties of the Fourier integral are studied for complex values of the frequency variable. The fourth part is devoted to the Fourier transforms of positive functions and to harmonic analysis. There are two appendices, the first of which contains a brief but good discussion of the theory of distributions as it applies to the delta-function; the second presents the elements of the theory of complex variables. The book is clearly written and is quite readable. It contains a large number of examples of applications of the Fourier integral, together with many exercises and their solutions, and should serve as a good textbook for a course on operational methods for engineers and applied scientists.

The Calculus of Variations. By Naum I. Akhiezer. Transl. from Russian by Aline H. Frink. 247 pp. Blaisdell Publishing Co., New York, 1962. $7.50. *Reviewed by T. Teichmann, General Dynamics Corp., General Atomic Division.*

THE majority of Western books on advanced mathematical topics that have appeared in the last few years have fallen in one of two categories: either elegant but abstract descriptions of the theory, or encyclopedic descriptions of applications. This has made it difficult for those readers who wish to learn more about the subject with no view to conducting mathematical research in it or solving arrays of engineering or physics problems. This translation from the Russian is aimed precisely at such readers in the field of calculus of