

BOOK REVIEWS

Mathematical methods of statistics. By H. Cramér. (Princeton Mathematical Series, no. 9.) Uppsala, Almqvist and Wiksells, 1945; Princeton University Press, 1946. 16+575 pp. \$6.00.

This book has long been needed, and its effect on the future development of mathematical statistics in both teaching and research will be sharp and lasting. The achievement of the author is to present the first treatise on statistics in which the mathematical developments are carried through according to standards of rigor comparable to those now customary in pure mathematics and excelling those in many fields of applied mathematics. He has accomplished this by integrating modern statistical concepts developed by the English and American schools of statisticians, with the mathematical methods of the modern work in probability of the French and Russians. While uniting these two streams he has added important contributions of his own.

The book is divided into three parts. Part I, called *Mathematical introduction*, consists mainly of an exposition of measure and integration, but contains also needed parts of matrix theory, theory of Fourier integrals, and some other topics. Part II, called *Random variables and probability distributions*, develops general concepts associated with random variables and applies them to some specific distributions such as the binomial, normal, chi-square, and so on. Part III, called *Statistical inference*, deals also with asymptotic and exact sampling distributions. Actually only a little over a fourth of the book deals specifically with statistical testing and estimation, and here the treatment is not exhaustive but limited to fundamentals. Much recent work of a fundamental character in statistical inference is omitted because the author's contact with foreign publications was curtailed by the war; for example, there is no reference to any of Wald's work. The main value of the book will be to supply mathematical background for those working in advanced mathematical statistics.

In his preface the author states that he has tried to make his book accessible to the reader with "a good working knowledge of the elements of the differential and integral calculus, algebra, and analytic geometry." However, a student not previously familiar with ϵ - δ analysis would find the book too difficult. On the other hand, the level of difficulty is much below that of the author's Cambridge Tract. The reviewer would guess that American students beginning graduate mathematics should be able to handle the book. At its chosen