Burckhardt, Paul Finsler, Heinz Hopf, H. Behnke and K. Stein, Elie-Cartan, Andreas Speiser, Max Gut, F. Gonseth.

W. W. FLEXNER

Les Probablitités Associées à un Système d'Événements Compatibles et Dépendants; I. *Événements en Nombre Fini Fixe.* By Maurice Fréchet. (Actualités Scientifiques et Industrielles, no. 859.) Paris, Hermann, 1940. 8+80 pp.

This is part one of a series of three, the others being: II. *Cas Particuliers et Applications*, and III. *Evénements en Nombre Très Grand ou Infini.* In this series Professor Fréchet has gathered together the hitherto scattered literature on a problem of rather general interest. The problem may be stated thus. We consider m quite general events $A_1, \cdots, A_m$ and an event H which is a function of these; that is, the occurrence or non-occurrence of H depends solely on which of the A's occur. The probability that $A_{j_1}, \cdots, A_{j_r}$ occur simultaneously is denoted by $p_{j_1 \cdots j_r}$. We wish to find the probability of H, granted that we know the values of the p's.

In Chapter I the author states and proves two interesting and powerful theorems due to Broderick. The first of these theorems asserts that the probability of H is a linear function of the p's, with coefficients depending not on the particular nature of the A's, but only on the function H. In the second theorem it is shown that if H is considered to be a function of two sets of events, then the probability of H can be obtained by a symbolic multiplication. The utility of these theorems in obtaining elegant solutions of certain classical problems will no doubt be demonstrated in the second volume of the series.

Chapter I also contains certain related formulae on moments, generating functions, and "conditional" probabilities. In Chapter II the author obtains a number of inequalities due to various writers, some in generalized form. In the remainder of the chapter questions of the following type are answered: what are the necessary and sufficient conditions that a set of 2^m numbers be the probabilities $p_{j_1 \cdots j_r}$ defined above, for some set of events $A_1, \cdots, A_m$?

The mathematics used throughout is on a quite elementary level so that the book should prove of interest to a wide circle of readers. A defect, in the reviewer's opinion, is the seemingly haphazard manner in which the various topics are arranged.

I. KAPLANSKY