

SHORTER NOTICES

Grundbegriffe und Grundprobleme der Korrelationstheorie. By A. A. Tschuprow. Leipzig-Berlin, Teubner, 1925. v+153 pp.

This book presents in extended form a series of lectures given in the insurance seminar of the University of Christiania. The main purpose of the book is to give a unified treatment of correlation theory with special reference to the fundamental conceptions and logical foundations of the theory. It seems to be very properly held that the treatment of the logical foundations of the method of correlation has not kept pace with the wide range of applications. The exposition does not proceed from the standpoint of the analysis of numerical data, but from the standpoint of a priori probability. The theory of correlation is regarded as an organic part of the theory of probability. The treatment seems fairly well described as an idealization of the somewhat empirical concepts of the English school of statisticians by a sharper formulation of definitions and underlying concepts.

Much is made of an expressive phraseology involving the concepts of chance variable and stochastic connection. A chance variable of order k is defined as a variable which takes any one of k values with assigned probabilities. For example, the number that will be thrown with a die in a single throw is a chance variable. When x is assigned, and y is a corresponding chance variable which takes values with definite probabilities, there is said to be a stochastic connection between x and y . For example, if in throwing two dice, the first gives a value $x=3$, then the corresponding total y for the two dice is $y=4, 5, 6, 7, 8$, or 9 , and there is a stochastic connection between the chance variables x and y . Much is made of the conception of stochastic dependence as distinguished from the more familiar conception of the functional dependence of two variables. In fact, the recognition of a clear distinction between the conceptions of stochastic connection and functional dependence constitutes a first step in following the exposition in this book.

The explanation of the stochastic connection of y with x follows the regression method, and calls for a complete characterization of the theoretical array (das bedingte Verteilungsgesetz) of y 's for any assigned x . While this conception is quite an advance over the early Pearson concept that y is correlated with x when the mean values of the theoretical arrays of y 's are not constant but are functions of x , the author has hardly given adequate credit to Pearson for a much more general view of correlation given in DRAPERS' COMPANY RESEARCH MEMOIRS, Biometric Series II (1905), p. 9. In this more general view we may say that whenever any characteristic of the theoretical arrays of y 's changes from one assigned value of x to another, there is a stochastic dependence.