

## RIETZ ON STATISTICS

*Mathematical Statistics.* By Henry Lewis Rietz. Chicago, Open Court, 1927. vii+181 pages.

This is Number Three of the Carus Mathematical Monographs of the Mathematical Association of America.\* As such, it is designed to give an exposition "comprehensible not only to teachers and students specializing in mathematics, but also to scientific workers in other fields." The author defines his main purpose as "shifting the emphasis and point of view in the study of statistics in the direction of the consideration of the underlying theory" and introducing "some of the recent advances in mathematical statistics to a wider range of readers." It must readily appear to the careful reader of the book that Professor Rietz has handsomely achieved his own stated purpose as well as the general purpose of the Carus series. The book does render available, as does no other volume written in English which is known to the reviewer, the essentials of an introductory survey of the underlying mathematical theory which must receive increasing attention from specialists in statistics, if the widespread use of statistical method is to be systematically helpful. Moreover, Professor Rietz has developed this theory so skillfully that the "workers in other fields," provided only that they have a passing familiarity with the grammar of mathematics, can secure a satisfactory understanding of the points involved.

As a general basis for developing the concepts of statistics, the author prefers to regard probability as the limit (if it exists) of the relative frequency, and it is likely that most practicing statisticians will agree with him.† Quite regardless of the considerable helpfulness of the concept of *a priori* probability, there can be little doubt that the notion of probability generally arises in practical problems of statistics as an adjunct in describing—one almost says "explaining"—observed frequencies. The idea of *description* is again prominent in the author's remark concerning the utility of fitted theoretical frequency curves: "Indeed, the use of the theoretical curve is likely to be justified in a large way only when it facilitates the study of the properties of the class of distributions of which the given one is a random sample by enabling us to make use of the properties of a mathematical function  $F(x)$  in establishing certain theoretical norms for the description of a class of actual distributions."

The author's definition of probability appears constantly in the background, particularly in Chapter II, entitled *Relative frequencies in simple*

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\* The first and second volumes of the series are: *Calculus of Variations*, by G. A. Bliss, 1925; and *Analytic Functions of a Complex Variable*, by D. R. Curtiss, 1926.

† His definition, to which he frankly says there are "some objections," is: "If the relative frequency of success approaches a limit when the trial is repeated indefinitely under the same set of circumstances, this limit is called the probability of success in one trial."