

ness as a source of theorems and examples. The latter are particularly rich in metric cases of projective theorems. The arrangement of material has a number of elegant features as, for example, the way in which theorems on conic sections are derived by projection and reciprocation from the corresponding theorems on circles.

O. VEBLEN.

Wahrscheinlichkeitsrechnung und Kollektivmasslehre. By Dr. HEINRICH BRUNS. Leipzig, Teubner, 1906. 310 + 18 pp.

ABOUT one third of this book is devoted to the theory of probability, and two thirds to Kollektivmasslehre. The theory of probability is treated as a theory of frequency, and from this point of view the part on probability is presented in excellent form for application to Kollektivmasslehre. The intimate relation between the two parts of the book stands out so clearly as to make it an important feature, especially because in the work of Fechner Kollektivmasslehre appears much more as an independent subject than as one so closely related to the theory of probability.

While Fechner and Pearson have, to a certain extent, treated Gauss's law of distribution as a "scientific dogma," and have presented generalized probability curves which fit well a large class of data, the conclusion that all distributions conform to one of these curves would have the same kind of logical weakness as the dogma of Gauss. Bearing on this point, Bruns makes a distinct advance by obtaining what seems to be a "suitable" analytic representation for an arbitrary frequency distribution. I use the term "suitable" because it is not difficult to get an analytic representation whose algebraic and numerical complications make it of no value for describing populations such as arise in applications.

Starting with a frequency distribution, the author constructs what he calls a "Summentafel" which gives the number of variates below given values. He uses the term "Summenfunktion" $S(x)$ to represent the relative frequency with which a variate lies below x . This function $S(x)$ and its derivative $V(x)$ (Verteilungsfunktion) are the functions for which the author obtains analytic representations. He treats the Summenfunktion as of fundamental importance rather than the distribution function, and in the process of reduction or smoothing which he employs the Summentafel is unchanged, while the frequency distribution may be very much changed.