Le Calcul des Probabilités—Son Évolution Mathématique et Philosophique. By L.-Gustave du Pasquier. Paris, Hermann, 1926. 21+304 pp., two tables.

Du Pasquier has written a delightful book in which the classic theory of probability centering around the so-called Theorem of Bernoulli is given in some detail, with an adequate setting in history, logic, and philosophy. Well chosen examples illustrate the use of the probability integral—for which two tables are given in the appendix—but the author is not interested primarily in technique. Nor has he found space for a mathematical treatment of generalized frequency functions, although he mentions the work of Pearson and others, and admits (p. 258) the inadequacy of the Gaussian function for biology. One of his chief purposes is to trace historically the ideas underlying the concept of probability—ideas very hazy at first, clarified to some extent by J. von Kries who insisted upon a "cogent reason" for cases declared to be "equally likely," made more lucid by means of the theory of ensembles used to determine "zones de comportement" (p. 217), and given a finishing touch by R. von Mises* who by the use of an infinite sequence as a "Kollektiv" with its accompanying "Verteilung" eliminates "equally likely cases" as a primary idea.

In Chapter V, six interpretations of probability are unfolded, designated: psychological, practical, logical, empirical, inductive, and interpretation by the zones of comportment. The view is held (pp. 188, 197, Chap. VI) that objective probability or "chance" exists, independent of human knowledge. Furthermore, even complete knowledge does not destroy probability—contrary to the view of Lourié (p. 203) that probability is the science for systematizing ignorance. The examples chosen to support Du Pasquier's contention are taken from the seemingly fortuitous behavior of numbers such as those forming the rth decimal place of the logarithms of consecutive integers. But later (p. 284) the author finds that such examples do not involve the "irregularity" demanded by the Second Postulate of von Mises—so they cannot be admitted to full standing as a "collectif," but must rank as a "syllepte" (p. 286).

The interesting applications in Chapter VII to the kinetic theory of gases, reversible and irreversible phenomena, entropy, etc., have a certain philosophic aroma. We are told (p. 229) that the phenomenon of fluctuation in the density of a gas adds a temperament to the inflexible determinism which rules the material universe.

Chapter VIII is devoted to the exposition of the theory of R. von Mises, setting forth the two postulates which determine a Kollektiv, and explaining the simple operations for deriving cumulative frequency functions from given cumulative frequency functions, "Verteilungen." This is well written, —in the statement of Postulate II, however (p. 266), there appears "ne soient pas nulles" instead of "nicht beide null." The concluding Chapter IX

* *Grundlagen der Wahrscheinlichkeitsrechnung*, Mathematische Zeitschrift, vol. 5 (1919), pp. 52–99.