

SHORTER NOTICES

Traité du Calcul des Probabilités et de ses Applications. Edited by Émile Borel. Paris, Gauthier-Villars, 1933.

Vol. I, Section IV: *Les Principes de la Statistique Mathématique.* By R. Risser and C. E. Traynard. xi+388 pp.

Vol. III, Section IV: *Théorie Mathématique de L'Assurance Invalidité et de L'Assurance Nuptialité, Définitions et Relations Fondamentales.* By Henri Galbrun. 156 pp.

Vol. III, Section V: *Théorie Mathématique de L'Assurance Invalidité et L'Assurance Nuptialité, Calcul des Primes et des Réserves.* By Henri Galbrun. 183 pp.

This is an excellent, up-to-date treatment of mathematical statistics, covering an extensive range of well-selected topics. The earlier problems of statistics are given correct perspective; but the main purpose of the book seems to be to put the reader into contact with important recent developments, so far as space permits. Means and moments for one or more variables are handled with the aid of characteristic functions. For classifying the Pearson Types use is made of the following two criteria:

$$s = \{6\beta_2 - \beta_1 - 1\} \div \{3\beta_1 - 2\beta_2 + 6\};$$

$$p = \{4s^2(s+1)\} \div \{\beta_1(s+2)^2 + 16(s+1)\}.$$

Following the Bruns-Charlier series in Hermite polynomials, there appears Romanovsky's generalization with the substitution for the normal function of other frequency functions. Probable errors of statistical constants are discussed briefly with references to Karl Pearson, R. A. Fisher, and Rietz's *Handbook of Mathematical Statistics*; but small samples are not given detailed treatment. For drawing balls from urns, the schemes of Bernoulli, Poisson, Lexis, Borel, and Pólya are described. For the resolution of a frequency curve into components, Karl Pearson's method is given; and successive approximations are considered. This completes Part I.

Part II, devoted to correlation and covariation, draws from the works of Tschuprow, Galton, K. Pearson, Fechner, Cheysson, Norton, March, Keynes, Yule, Darrois, Lévy, Cantelli, Lexis, Bachelier, Edgeworth, Kneser, Myller-Lebedeff, Gram, Thiele, Charlier, Bruns, Galbrun, Guldberg, MacMahon, Student, Tchebycheff, Markoff, Bortkiewicz, Anderson, Steffensen, Sheppard, and Frisch. As part of this wealth of material may be mentioned the subject of probable values or mathematical expectation as developed by Tschuprow, the correlation surface in n dimensions as established by Pearson, also his chi-square surface, the Yule treatment of multiple and partial correlation, Anderson's variate difference method of dealing with correlation or covariation, Steffensen's modification of mean-square contingency, and Guldberg's difference equations for choosing the form of frequency functions.

In Section IV of the third volume a decidedly general treatment, based upon instantaneous rates, is given for insurance supplementary to life insurance. Disability is taken as representative of the entry into a new class where new mortality rates must be used; marriage as representative of the entry