

ON CERTAIN TOPICS IN THE MATHEMATICAL THEORY OF STATISTICS*

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1. *Introduction.* The mathematical theory of statistics dates back to the first publication† relating to Bernoulli's theorem in 1713. The line of development started by Bernoulli was carried forward by DeMoivre,‡ Stirling,§ Maclaurin,|| and Euler¶ culminating in the formulation of the Bernoulli theorem by Laplace** in substantially the form in which it still holds a fundamental place in mathematical statistics.

The *Théorie Analytique des Probabilités* of Laplace is undoubtedly the most significant publication at the basis of the development of mathematical statistics. Strangely enough, for a period of more than fifty years following the publication of the work of Laplace in 1812, little of importance was contributed to the subject. To be sure, the second law of error of Laplace was developed by Gauss and given its important place in the adjustment of observations, but there was on the whole relatively little progress. Perhaps a complex of causes was involved, but three fairly plausible reasons may be assigned for the lack of contributions to mathematical statistics at this period. First, Laplace left many of his results in the form of approximations

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† James Bernoulli, *Ars Conjectandi*, 1713, pp. 210-39 (published eight years after his death).

‡ A. DeMoivre, *Doctrine of Chances* (3rd ed. 1756) pp. 243-54. *Miscellanea Analytica*, 1730, pp. 191-97, Supplement.

§ J. Stirling, *Methodus Differentialis*, 1730, p. 135.

|| C. Maclaurin, *A Treatise on Fluxions*, 1742, p. 672.

¶ L. Euler, COMM. ACAD. PETROP. 6, 1732-33, ed. 1738, pp. 88-97.

** P. S. Laplace, *Théorie Analytique des Probabilités*, 3ième ed., 1820, vol. II, Chap. III, pp. 280-85.